MONOGRAPH OF THE NORTH AND CENTRAL AMERICAN SPECIES OF THE GENUS SENECIO—PART II[1]

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Sect. 6. Aurei Rydb.

§ 6. Aurei Rydb. Bull. Torr. Bot. Club **27**:173. 1900; Greenm. Monogr. Senecio, I. Teil, 22, 23, 29, 30. 1901, and in Engl. Bot. Jahrb. **32**:18, 19, 25, 26. 1902.

Herbaceous perennials, glabrous or in the early stages floccose-tomentose and more or less glabrate except in the axils of the leaves and occasionally at the base of the stem; stems erect or ascending, 1 to 10 dm. high, one to several from a common base or rootstock; leaves variable, the lowermost petiolate, rotund-ovate, oblong-ovate, obovate to narrowly oblanceolate, entire, crenate or dentate to more or less lyrate; stem-leaves petiolate to sessile, pinnatisect to entire, usually reduced towards the cymose inflorescence; heads radiate or discoid; achenes glabrous or hirtellous along the angles. Sp. 33–80.

Key to the Species

A. Stems 1 to 10 dm. high, erect or nearly so, simple or branched; heads one to many, discoid (except in *S. pauciflorus* var. *fallax*); achenes glabrous.

  a. Plants small, 1.5 dm. or less high; lower leaves subentire or sharply dentate.

    α. Lower leaves subentire..... *33. S. fedifolius*

    β. Lower leaves sharply dentate..... *34. S. Fernaldii*

  b. Plants larger, 1.5 to 10 dm. high; leaves thin in texture, the lower crenate-dentate.

[1]Issued July 7, 1916

Note.—The present paper is continued from Ann. Mo. Bot. Gard. **2**:573–626. 1915.

α. Stem-leaves .5 to 3 cm. broad, usually with rather crowded divisions and narrow sinuses.

I. Heads discoid.

1. Lower leaves obovate..... *48a. S. obovatus* var. *elongatus*

2. Lower leaves ovate..... *35. S. pauciflorus*

II. Heads radiate ..... *35a. S. pauciflorus* var. *fallax*

β. Stem-leaves 1 to 6 cm. broad with remote divisions and deep rounded sinuses ..... *36. S. idahoensis*

c. Plants 1 to 6 dm. high; leaves thickish in texture, the lower entire, crenate to unequally lobate-dentate. ..... *37. S. debilis*

B. Stems erect or ascending, .5 to 4 dm. high, simple or branched; heads radiate, usually solitary; achenes glabrous or hirtellous.

a. Leaves mostly irregularly lobed or sublyrate.

α. Achenes hirtellous ..... *38. S. hyperborealis*

β. Achenes glabrous ..... *39. S. resedifolius*

b. Leaves mostly or all undivided.

α. Leaves thickish in texture; heads 8 to 14 mm. high.

I. Plants glabrous or nearly so..... *40. S. ovinus*

II. Plants white-tomentose at the base and in the leaf-axils.

1. Heads 12 to 14 mm. high; involucral bracts 21 ..... *41. S. conterminus*

2. Heads 8 to 10 mm. high; involucral bracts 13 ..... *42. S. hesperius*

β. Leaves thin in texture; heads 8 to 12 mm. high.

I. Plants of northern United States and Canada.

1. Lower leaves coarsely dentate. *43. S. Newcombei*

2. Lower leaves crenate-dentate. *44. S. subnudus*

II. Plants of Mexico..... *45. S. Rosei*

γ. Leaves reniform to oblong-obovate, thickish in texture; heads 14 to 20 mm. high.

I. Leaves reniform ..... *46. S. Porteri*

II. Leaves subrotund to oblong-obovate ..... *47. S. Soldanella*

C. Stems usually erect, 1.5 to 7 dm. high, simple or branched; heads commonly several to many, usually radiate (discoid in *S. obovatus* var. *elongatus*, *S. rubricaulis* var. *aphanactis* and rarely in *S. pauperculus*).

a. Leaves thin in texture, not succulent in the living state.

α. Basal leaves obovate, subrotund to oblong-elliptic, usually glabrous.... *48. S. obovatus*

β. Basal leaves rotund-ovate, oblong-ovate to oblong-lanceolate, cordate to abruptly narrowed at the base, glabrous or glabrate.

I. Lower leaves rotund-ovate, usually deeply cordate.

1. Heads few, 1 to 3..... *49. S. Cardamine*

2. Heads several to many.

* Plants of Mexico.

† Terminal segment of stem-leaves broader than long; achenes hispidulous ..... *50. S. cyclophyllus*

†† Terminal segment of stem-leaves not broader than long; achenes glabrous ... *51. S. quebradensis*

** Plants of western United States ..... *52. S. Pammelii*

*** Plants of eastern United States ..... *53. S. aureus*

II. Lower leaves ovate to oblong-lanceolate, shallowly cordate or abruptly narrowed at the base.

1. Margins of lower leaves crenate-dentate to doubly serrate.

* Lower leaves, at least some of them, shallowly cordate.

† Basal leaves oblong-lanceolate ..... *54. S. Robbinsii*

†† Basal leaves ovate.

‖ Margins of lower leaves finely serrate with incurved teeth. *55. S. pseudaureus*

‖‖ Margins of lower leaves more coarsely and more saliently toothed.

o. Bracteoles broad, obtuse.. *35a. S. pauciflorus* var. *fallax*

oo. Bracteoles narrow, acute . *56. S. Burkei*

** Lower leaves abruptly cuneate at the base, not cordate.

† Eastern species.

‖ Upper leaves pinnately divided ..... *57. S. gaspensis*

||| Upper leaves incised-serrate ..... 58. *S. Crawfordii*

†† Western species.

|| Divisions of stem-leaves narrow ..... 59. *S. quaerens*

||| Divisions of stem-leaves broad ..... 60. *S. platylobus*

2. Margins of lower leaves entire or nearly so.

* Rays usually orange-red or saffron-colored ..... 61. *S. crocatus*

** Rays lemon-yellow.

† Stems closely cespitose ..... 62. *S. aquariensis*

†† Stems not closely cespitose.

|| Upper leaves conspicuously dilated into a broad amplexicaul base .... 63. *S. dimorphophyllus*

||| Upper leaves not conspicuously dilated into a broad amplexicaul base ... 64. *S. Farriae*

Y. Basal leaves oblong-ovate to lanceolate, often shallowly cordate; stems and leaves more or less persistently white-tomentulose, rarely glabrous.

I. Plants of the mountains of Arizona and New Mexico; achenes glabrous ..... 65. *S. Hartianus*

II. Plants of the low country and prairie throughout central United States; achenes usually hispidulous ..... 66. *S. plattensis*

δ. Basal leaves oblanceolate (except in *S. pauperculus* var. *firmifolius*), gradually narrowed at the base, glabrous or glabrate.

I. Plants subglaucous ..... 67. *S. Willingii*

II. Plants not at all glaucous.

1. Stems rather densely and permanently tomentose at the base; heads usually numerous. 68. *S. Smallii*

2. Stems but slightly tomentose at the base; heads comparatively few.

* Heads 5 to 9 mm. high; stems not flexuous.

† Eastern species ..... 69. *S. pauperculus*

†† Western species ..... 70. *S. flavovirens*

** Heads 10 to 13 mm. high; stems often flexuous ..... 71. *S. multnomensis*

b. Leaves usually thick or firm in texture, more or less succulent in the living state.

α. Lower leaves ovate to obovate, subentire to crenate-dentate.

I. Lower leaves broadly oval to elliptic-oblong, subentire to crenate-dentate.

1. Stems 2.5 to 5 dm. high..... *72. S. laetiflorus*

2. Stems usually lower, 1 to 2.5 dm. high ..... *73. S. Suksdorfii*

II. Lower leaves mostly obovate, entire to sharply dentate.

1. Lower leaves coarsely dentate. *74. S. rubricaulis*

2. Lower leaves entire or dentate towards the apex only..... *75. S. cymbalarioides*

β. Lower leaves mostly oblanceolate, entire or dentate chiefly towards the apex.

I. Plants 1 to 4 dm. high; cymes open, more or less flat-topped.

1. Stems tending to be leafy; leaves .5 to 2 cm. wide, achenes glabrous ..... *76. S. acutidens*

2. Stems not leafy; leaves narrower, .5–1 cm. wide; achenes hirtellous ..... *77. S. tridenticulatus*

II. Plants less than 1 dm. high; cymes close, somewhat rounded.. *78. S. Wardii*

γ. Lower leaves larger, ovate to oblanceolate, subentire to coarsely and saliently dentate with subcartilaginous teeth.

I. Leaves entire or only slightly dentate, somewhat glaucous; plants of the United States ..... *79. S. anacletus*

II. Leaves usually coarsely dentate, not glaucous; plants of Mexico. *80. S. toluccanus*

33. S. fedifolius Rydb. Bull. Torr. Bot. Club **27**:183, *pl. 5, fig. 7.* 1900, and Fl. Colo. 397. 1906; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

S. discoideus Nelson in Coulter & Nelson, Manual Cent. Rocky Mountains 583. 1909, in part.

An herbaceous perennial; stem slender, 1.5 dm. high; basal leaves petiolate, blade ovate or broadly oval, 1 to 2 cm. long, entire or wavy margined; stem-leaves small, pinnately divided into short linear-oblong segments; heads 2 to 3, about 6 mm. high, discoid; involucral bracts commonly 13, lanceolate with membranous margins; achenes glabrous.

Distribution: mountains of Colorado.

Colorado: South Park, coll. of 1871, *Canby* (N. Y. College of Pharmacy Herb.), TYPE.

34. S. Fernaldii Greenm.[1]

A small herbaceous perennial, glabrous or slightly tomentose in the axils of the leaves, more or less purplish; stem erect, 1 dm. or less high, rising from an oblique rootstock; lower leaves petiolate, ovate to obovate-cuneate, including the petiole 1.5 to 3 cm. long, 1 to 1.5 cm. broad, sharply dentate; stem-leaves pinnatisect, the uppermost reduced to mere bracts; head solitary, discoid, 10 to 12 mm. high; involucre campanulate, calyculate; bracts of the involucre about 21, linear-lanceolate, 7 to 8 mm. long, a little shorter than the numerous flowers of the disk, purple; achenes glabrous.

Distribution: western Newfoundland.

Specimen examined:

Newfoundland: dry limestone barrens, upper slopes, and tablelands, Table Mountain, alt. 200–300 m., 16 Aug., 1910,

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[1] **Senecio Fernaldii** Greenm. sp. nov., herbaceus perennis glabrus vel in axillis foliorum parum tomentosus plus minusve purpurascens; caule erecto 1 dm. vel minus alto; foliis inferioribus petiolatis ovatis vel obovato-cuneatis petiolo incluso 1.5–3 cm. longis 1–1.5 cm. latis acute dentatis, superioribus pinnatisectis gradatim reductis; capitulo solitario 10–12 mm. alto discoideo; involucri squamis circiter 21 lineari-lanceolatis 7–8 mm. longis; flosculis disci numerosis; achaeniis glabris. —On dry limestone barrens, upper slopes, and tablelands of Table Mountain, Newfoundland, alt. 200–300 m., 16 Aug., 1910, *Fernald & Wiegand 4188* (Gray Herb., photograph in Mo. Bot. Gard. Herb.), TYPE.

Fernald & Wiegand 4188 (Gray Herb., photograph in Mo. Bot. Gard. Herb.), TYPE.

35. S. pauciflorus Pursh, Fl. Am. Sept. **2**:529. 1814, and ed. 2, 1816; Schlecht. in Linnaea **10**:90. 1836; DC. Prodr. **6**:431. 1837; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Piper, Contr. U. S. Nat. Herb. **11**:597. 1906; Piper & Beattie, Fl. Northwest Coast 387. 1915.

S. aureus δ. *discoideus* Hook. Fl. Bor. Am. **1**:333. 1834; Torr. & Gray, Fl. N. Am. **2**:442. 1843, in part.

S. aureus var. *borealis* Gray, Syn. Fl. N. Am. **1**:391. 1884, and ed. 2, 1886, in part, i. e., as to *S. pauciflorus* Pursh in synonymy.

S. Lemberti Greene, Pittonia **3**:89. 1896.

S. indecorus Greene, Fl. Franciscana 470. 1897.

S. aureus pauciflorus Britt. in Britton & Brown, Ill. Fl. **3**:480. 1898.

S. discoideus Britt. in Britton & Brown, Ill. Fl. **3**:479, *fig. 4042*. 1898, and ed. 2, **3**:544, *fig. 4626*. 1913.

S. elongatus Howell, Fl. Northwest Am. **1**:379. 1900, in part, not Pursh.

S. aureus Britt. in Britton & Brown, Ill. Fl. **3**:544. 1913, in part, i. e., as to *S. pauciflorus* Pursh in synonymy.

An herbaceous perennial, glabrous or with a white-floccose tomentum in the axils of the leaves and in the inflorescence; stems one to several from a common base, erect or ascending, 1 to 10 dm. high; lower leaves petiolate, ovate-rotund to ovate-oblong, 1 to 8 cm. long, 1 to 4.5 cm. broad, crenate-dentate, glabrous on both surfaces, their petioles equalling or twice exceeding the blade; stem-leaves sublyrate to pinnatisect, the uppermost sessile and much reduced; inflorescence a few to many-headed corymbose cyme; heads discoid, 10 to 12 mm. high; involucre campanulate, calyculate; bracts of the involucre usually about 21, linear-lanceolate, acute or acutish, more or less purplish; flowers numerous; achenes glabrous.

Distribution: usually in bogs and wet places, Labrador, eastern Quebec, northern Michigan, across the continent to the

Rocky Mountains, northwest to Alaska, and south to northern California.

Specimens examined:

Labrador: specimen from the Pursh herbarium, *ex Herb. Dickson* (Phil. Acad. Nat. Sci. Herb.); without locality, "*Leconte*" (Phil. Acad. Nat. Sci. Herb.); about Hokhak and Hebron, *fratres Morav.* (Gray Herb.); northern Labrador, Lat. 58°, coll. of 1873, *Anspach* (Mo. Bot. Gard. Herb.); wet crevices of rocks, Nachvak, 1 Aug., 1884, *Bell 14778* (Geol. Surv. Canada Herb.); Long Point, Aug., 1892, *Waghorne 4* (Geol. Surv. Canada Herb. and Mo. Bot. Gard. Herb.); Capstan Island, Aug., 1893, *Waghorne 9* (U. S. Nat. Herb.); near Forteau, coll. of 1894, *Waghorne 20* (Mo. Bot. Gard. Herb.); Rama, Lat. 58°50′, July, 1894, *Sornborger* (Gray Herb.); Rama, 20–24 Aug., 1897, *Sornborger 67* (Gray Herb. and U. S. Nat. Herb.); Rama, 15 July–20 Aug., 1897, *Stecker 67*[a] (Mo. Bot. Gard. Herb.); without locality, *Dr. Morrison* (Kew Herb.).

Quebec: Lake Petitsikapau, Hamilton River, 26 June, 1894, *Low 5104* (Geol. Surv. Canada Herb.); sandy shores of River Ste. Anne des Monts, Gaspé, 19 Aug., 1882, *Macoun 14808* (Geol. Surv. Canada Herb.); calcareous alpine meadow, Table-top Mountain, Gaspé Co., alt. 1000–1125 m., 7 Aug., 1906, *Fernald & Collins 261* (U. S. Nat. Herb.); on limestone conglomerate cliffs, peak west of Baptiste Michaud's, Bic, Rimouski Co., 16 July, 1904, *Collins & Fernald* (Gray Herb.); wet meadow, Bic, 22 July, 1910, *Williamson 1418* (C. S. Williamson Herb.); arbor-vitae swamps, Carleton, Bonaventure Co., 24–27 July, 1904, *Collins, Fernald & Pease* (Gray Herb.).

Ontario: wet gravelly places, Nipigon River, 2 July, 1884, *Macoun 14782* (Geol. Surv. Canada Herb.); bogs north of Port Arthur, 6 Aug., 1912, *Williamson 2148* (Phil. Acad. Nat. Sci. Herb.); Fort William, 24 July, 1912, *Williamson 1722* (Phil. Acad. Nat. Sci. Herb.); near Lake Superior, *Macoun 53* (Mo. Bot. Gard. Herb.).

Michigan: Keweenaw Peninsula, coll. of 1863, *Robbins 121* (Gray Herb.); Keweenaw Peninsula, July, 1890, and 7 July,

1915, *Farwell 776* (Gray Herb. and Mo. Bot. Gard. Herb.); Champion, July, 1889, *Hill* (Gray Herb.).

Rocky Mountains: "Grand saline, R. M. E. side," *Burke* (Gray Herb.).

Montana: Gallatin Valley, near Bozeman, alt. 1615 m., 7 July, 1896, *Flodman 908* (Mo. Bot. Gard. Herb., Greene Herb., and U. S. Nat. Herb.); wet shady places, Gallatin River, 14 July, 1905, *Blankenship 292* (Mo. Bot. Gard. Herb., Phil. Acad. Nat. Sci. Herb., Field Mus. Herb., and U. S. Nat. Herb.).

Wyoming: Little Goose Cañon, Sheridan Co., 1 July, 1901, *Nelson 2383* (Mo. Bot. Gard. Herb.); Middle Ten Sleep Creek, Big Horn Co., 1 Aug., 1901, *Goodding 465* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

Idaho: Forks of St. Mary's River, alt 1100 m., 3 July, 1895, *Leiberg 1158* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

Alberta: below Pipestone Summit, Rocky Mountain Park, 6 July, 1904, *Macoun 65018* (Gray Herb. and Geol. Surv. Canada Herb.); Blind Valley and Lakes, alt. 2130–2440 m., 6 July, 1906, *Brown 414* (Phil. Acad. Nat. Sci. Herb.); head of Snake River, 5 Aug., 1911, *Riley 32* (U. S. Nat. Herb.).

Mackenzie: Fort Franklin, Mackenzie River, *Richardson* (Geol. Surv. Canada Herb., photograph in Field Mus. Herb. and in Mo. Bot. Gard. Herb.), part of TYPE of *S. aureus* var. *discoideus* Hook.

Yukon: Ft. Selkirk, 18 July, 1899, *Tarleton 134* (U. S. Nat. Herb.); vicinity of Summit and Middle Lakes, coll. of 1898, *Bolton* (U. S. Nat. Herb.); moist glades, Red Mountain, 17 July, 1899, *Gorman 1114* (U. S. Nat. Herb.); Moosehide Mountain, Dawson, 14 July, 1902, *Macoun 78974* (Field Mus. Herb.); damp woods, West Dawson, 16 July, 1902, *Macoun 78975* (Field Mus. Herb.); Finlayson River, Lat. 61°N., *Dawson 14776* (Geol. Surv. Canada Herb.).

Alaska: south bank of Forty Mile Creek, Yukon River, 13 July, 1893, *Funston 126* (U. S. Nat. Herb.); near Knik, Oct., 1913, *Chaney* (Mo. Bot. Gard. Herb.); Kenai, 18–20 Aug., 1904, *Piper 4216* (U. S. Nat. Herb.).

British Columbia: Moose Lake, 14–24 Aug., 1911, *Riley 22* (U. S. Nat. Herb.); Kicking Horse Lake, alt. 1675 m., 15 Aug., 1890, *Macoun 14771* (Geol. Surv. Canada Herb.); Kicking Horse Valley, near Field, alt. 1230 m., 20 June–25 July, 1906, *Brown 487*[a] (Phil. Acad. Nat. Sci. Herb.); Ottertail Drive, near Field, July, 1905, *Farr 814, 820* (Univ. Penn. Herb. and Field Mus. Herb.); Wapta Lake, 4 Aug., 1904, *Macoun 65019, 65020* (Gray Herb. and Geol. Surv. Canada Herb.); Carbonate, alt. 825 m., 7 July, 1904, *Heacock 185* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Upper Spillmacheen Valley, alt. 1980 m., 3 Aug., 1904, *Petersen 440* (Gray Herb., U. S. Nat. Herb., Mo. Bot. Gard. Herb., and Phil. Acad. Nat. Sci. Herb.); Cornwall Hills, 28 July, 1894, *McCoy 5100* (Gray Herb. and Geol. Surv. Canada Herb.); Skagit Valley, 28 June, 1905, *Macoun 69360* (Gray Herb.); Maclennan River, branch of Columbia River, 31 July, 1898, *Spreadborough 19727* (Geol. Surv. Canada Herb. and Greene Herb.); Chilliwack Valley, 22 June, 1901, *Macoun 26683* (Gray Herb., Geol. Surv. Canada Herb., and Mo. Bot. Gard. Herb.), *26684* and *26685* in part (Gray Herb. and Geol. Surv. Canada Herb.); alpine rivulet, Goldstream, alt. 1675 m., 25 July, 1905, *Shaw 1012* (U. S. Nat. Herb.); Alberni, Arrowsmith Trail, Vancouver Island, 27 June, 1907, *Rosendahl 1971* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Wolf Creek, Strathcona Park, Vancouver Island, 10 Aug., 1912, *Macoun 83192* (Geol. Surv. Canada Herb. and Mo. Bot. Gard. Herb.); Kasaan Mountain, Queen Charlotte Island, 7 July, 1901–02, *Newcombe 69* (Field Mus. Herb.).

Washington: Deming, Whatcom Co., 30 June, 1898, *Flett 852* in part (Piper Herb.); Big Meadows, six miles west of Ione, 6 Aug., 1902, *Kreager 428* (Gray Herb., U. S. Nat. Herb., and Piper Herb.); Mt. Constitution, Dreas Island, Aug., 1892, *Henderson 2312* (Gray Herb.).

California: Truckee, 16 June, 1901, *Williamson* (C. S. Williamson Herb.); Mt. Dana, coll. of 1866, *Bolander 6021* (Field Mus. Herb.) and *6021* in part (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Lassens Peak, July, 1896, *Austin 365* (U. S. Nat.

Herb. and Mo. Bot. Gard. Herb.); Pine Creek, Lassen Co., 9 July, 1894, *Baker & Nutting* (Greene Herb.), TYPE of *S. indecorus;* Sierra Co., coll. of 1874, *Lemmon 127* (Mo. Bot. Gard. Herb.); Sierra Nevada Mountains, coll. of 1875, *Lemmon* (U. S. Nat. Herb. 48716); Soda Springs, Tuolumne Co., July, 1894, *Lembert 171* (Gray Herb.); Yosemite Region, coll. of 1893, *Lembert* (Gray Herb. and Greene Herb. in part); Soda Springs, Mt. Conness, 6 Aug., 1890, *Harford* (Greene Herb.), TYPE of *S. Lemberti.*

To this species are also to be referred two specimens without record of locality, namely, one from the collection of Nuttall, presented by Elias Durand, 1866 (Gray Herb.), and one from the Bernhardi collection (Mo. Bot. Gard. Herb.).

Var. **fallax** Greenm. Contr. U. S. Nat. Herb. **11**:597. 1906, and in Piper & Beattie, Fl. Northwest Coast 388. 1915.

Similar in stature and in foliage to the species; heads radiate; ray-flowers 10 to 12, rays yellow; disk-flowers 50 to 60; achenes glabrous.

Distribution: occurring occasionally with the species.

Specimens examined:

Ontario: Silver Islet Beach, 4 Aug., 1914, *Williamson 2075* (C. S. Williamson Herb.); Port Arthur, 6 Aug., 1914, *Williamson 2148* (C. S. Williamson Herb.).

Michigan: Mainland Park Harbor, Isle Royal, 15–16 Aug., 1912, *Williamson 2312* (Phil. Acad. Nat. Sci. Herb.).

Alaska: along the Yukon River, near Ft. Yukon, coll. of 1881, *Bates* (U. S. Nat. Herb. 48813, 48814, and Greene Herb.).

Washington: Deming, Whatcom Co., 30 June, 1898, *Flett 852* in part (Piper Herb.).

California: Mt. Dana, coll. of 1866, *Bolander 6021* in part (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Yosemite Region, coll. of 1895, *Lembert* (Gray Herb. and U. S. Nat. Herb.); Mt. Goddard, alt. 3050 m., *Hall & Chandler 660* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); along the North Fork of Kern River, Sierra Nevada, 25 Aug., 1891, *Coville & Funston 1708* (U. S. Nat. Herb.).

36. S. idahoensis Rydb. Bull. Torr. Bot. Club **27**:183, *pl. 6, fig. 5.* 1900; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

A rather stout herbaceous perennial, 4 to 7 dm. high, glabrous or slightly white floccose-tomentulose in the axils of the leaves; stem branched from near the base, rather leafy in the lower portion, nearly naked towards the inflorescence, stramineous to somewhat purplish; leaves 2.5 to 14 cm. long, 1 to 6 cm. broad, mostly pinnately parted into oblong or somewhat cuneate subincised divisions with broad and deep rounded sinuses; inflorescence terminating the stem and branches in a several to many-headed corymbose cyme; heads discoid, 10 to 12 mm. high; involucre campanulate, calyculate; bracts of the involucre commonly 21, linear-lanceolate, 7 to 9 mm. long, acutish, more or less purplish-tipped; flowers numerous; achenes glabrous.

Distribution: Idaho, northwest into British Columbia.

Specimens examined:

Idaho: in meadows at Granite Station, Kootenai Co., 30 Aug., 1892, *Sandberg, MacDougal & Heller 803* (Gray Herb. and Phil. Acad. Nat. Sci. Herb.), CO-TYPE.

British Columbia: Griffin Lake, 6 July, 1889, *Macoun,* without number (Gray Herb.).

A species very near the preceding from which, however, it differs in the branching of the stem and by the large broad stem-leaves with cut divisions and deep rounded sinuses.

37. S. debilis Nutt. in Trans. Am. Phil. Soc. **7**:408. 1841; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Blankenship in Mont. Agr. Coll. Sci. Studies **1**:102. 1904.

S. aureus var. *discoideus* Torr. & Gray, Fl. N. Am. **2**:442. 1843, in part, i. e., as to *S. debilis* Nutt. in synonymy.

S. aureus var. *borealis* Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886, in part.

S. flavovirens Rydb. Bull. Torr. Bot. Club **27**:181. 1900, in part, as to plant of Greene.

S. nephrophyllus Rydb. Mem. N. Y. Bot. Gard. **1**:446. 1900, and in Bull. Torr. Bot. Club **27**:183. 1900.

S. discoideus Nelson in Coulter & Nelson, Manual Cent. Rocky Mountains 583. 1909, in part, not *S. aureus* var. *discoideus* Hook.

An erect herbaceous perennial, glabrous throughout or slightly floccose-tomentulose in the axils of the leaves and along the midrib on the upper surface of the young leaves; stems 1 to 5 dm. high; leaves thickish in texture; basal leaves petiolate, subreniform to ovate-oblong, 1 to 6 cm. long, 1 to 4 cm. broad, entire, crenately and unequally lobate-dentate; petioles variable in length from 1.5 cm. to nearly 2 dm. long; stem-leaves petiolate or sessile, sublyrate to pinnately divided into remote linear-oblong or subcuneate obtusish, often unequal, divisions and deep rounded sinuses; inflorescence terminating the stem in a few to several-headed corymbose cyme; heads 7 to 10 mm. high, discoid; flowers numerous; achenes glabrous.

Distribution: Montana and Colorado, west to Idaho and Oregon.

Specimens examined:

Montana: meadows, Big Blackfoot River, 13 July, 1883, *Canby 34* (Gray Herb.), and *203* (Phil. Acad. Nat. Sci. Herb.); Melrose, 6 July, 1895, *Shear 5011* (U. S. Nat. Herb.).

Wyoming: Laramie Plains, alt. 2590 m., 20 July, 1884, *Sheldon 73* (U. S. Nat. Herb.); Laramie, 28 July, 1889, *Greene* (U. S. Nat. Herb. and Field Mus. Herb.); Laramie hills, 17 July, 1897, *Nelson 3404* (Mont. Agr. Coll. Herb.); Laramie Plains, 21 July, 1898, *Osterhout* (Field Mus. Herb.); wet banks, City Springs, Laramie, 8 Aug., 1901, *Nelson 8599* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Laramie River, along the Medicine Bow Mountains, coll. of 1856, *H. Engelmann* (Gray Herb. and Mo. Bot. Gard. Herb.); wet meadows, Centennial, 27 July, 1900, *Nelson 7722* (Mo. Bot. Gard. Herb.); boggy draws, Centennial, 27 July, 1902, *Nelson 8685* (Gray Herb., U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); Wind River bottom, 28 July,

1882, *Forwood* (Gray Herb. and U. S. Nat. Herb.); Meadow Creek, 9 Aug., 1894, *Nelson 906* (Gray Herb. and Greene Herb.); Bridger's Pass, coll. of 1856, *H. Engelmann* (Gray Herb.); Soldier Springs, Aug., 1891, *Nelson 177* (U. S. Nat. Herb.).

Colorado: Rocky Mountains, coll. of 1861, *Parry 19* (Phil. Acad. Nat. Sci. Herb.); Rocky Mountains, Lat. 39°41′, coll. of 1862, *Hall & Harbour 332* in part (Mo. Bot. Gard. Herb. and Gray Herb.); Lake John, 19 Aug., 1898, *Shear & Bessey 3990* (U. S. Nat. Herb.); near High, 19 Aug., 1898, *Shear & Bessey 4005* (U. S. Nat. Herb.).

Idaho: grassy bog, One Thousand Springs Valley, alt. 2040 m., 7 Aug., 1895, *Henderson 3671* (U. S. Nat. Herb.).

Oregon: "Plains of the Oregon, near the Wahlamet," *Nuttall* (Gray Herb.), TYPE.

38. S. hyperborealis Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Ann. Mo. Bot. Gard. **1**:264. 1914.

S. resedifolius Hook. Fl. Bor. Am. **1**:333, *pl. 117*. 1834, in part, not Less.; DC. Prodr. **6**:347. 1837, in part; Torr. & Gray, Fl. N. Am. **2**:445. 1843, in part; Gray, Syn. Fl. N. Am. **1**²:390. 1884, and ed. 2, 1886, in part; Macoun, Cat. Canadian Pl. 267. 1884, in part, i. e., as to plant of Richardson.

Stems erect or nearly so, one to several from a perennial base, 1 to 2 dm. high, simple or branched, white-tomentose at the base and in the leaf-axils; lower leaves obovate and crenately margined to sublyrate or pinnately divided with rather remote obtusely dentate divisions, including the petiole 4 to 10 cm. long, 1 to 2.5 cm. broad; stem-leaves sessile, more or less pinnatisect, the uppermost reduced to lance-attenuate entire bracts; heads solitary or few terminating the stem and branches, 8 to 12 mm. high, radiate; involucre campanulate, sparingly calyculate, glabrous; bracts of the involucre about 13, lanceolate, acute, 5 to 6 mm. long; ray-flowers 10 to 12, rays yellow; disk-flowers rather numerous; achenes hirtellous-puberulent along the angles.

Distribution: Arctic northwest America.

Specimens examined:

Mackenzie: "on limestone at the mouth of the Bear Lake River, and about Fort Norman and Fort Franklin," *Richardson* (Gray Herb. ex Hooker, Torrey Herb., and Geol. Surv. Canada Herb. 14872 in part), CO-TYPE; west shore of Great Bear Lake, June–Aug., 1900, *Bell 22937* (Geol. Surv. Canada Herb.).

39. S. resedifolius Less. in Linnaea **6**:243. 1831; Ledeb. Fl. Rossica **2**:631. 1844–46, in major part; DC. Prodr. **6**:347. 1837, in major part; Torr. & Gray, Fl. N. Am. **2**:445. 1843, in part; Gray, Syn. Fl. N. Am. **1**^{2}:390. 1884, and ed. 2, 1886, in part; Macoun, Cat. Canadian Pl. 267. 1884, in part; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

Cineraria lyrata Ledeb. in Mem. Acad. Petersb. **5**:576. 1818; Reichb. Ic. Bot. **2**:1, *pl. 101*. 1824; Hook. & Arn. Bot. Beechey's Voy. 126. 1832.

A low herb; stems one to several from a perennial base, simple or branched, .5 to 2 dm. high, glabrous or slightly tomentose, particularly in the axils of the leaves; lower leaves petiolate, rotund-ovate, sublyrate or irregularly pinnately divided, crenate to sharply dentate; upper stem-leaves sessile, more or less pinnatisect, often reduced to lance-attenuate entire bracts; heads solitary or few, radiate, about 1 cm. high, including the rays 2 to 2.5 cm. in diameter; bracts of the calyculate involucre linear-lanceolate, 6 to 8 mm. long, acuminate, acute, often purplish; achenes glabrous.

Distribution: Alaska and Siberia.

Specimens examined:

Alaska: St. Lawrence Island, *Chamisso* (Gray Herb., Berlin Herb., and Kew Herb.); Behring Strait, U. S. North Pacific Exploring Expedition, 1853–56, *Wright* (Gray Herb.); Hall Island, Behring Sea, coll. of 1885, *Thompson* (Field Mus. Herb.); Hall Island, Behring Sea, 11 Aug., 1891, *Macoun 20640* (Geol. Surv. Canada Herb.); Herschel Island, Arctic Sea, coll. of 1893, *Stringer 14390* (Geol. Surv. Canada Herb.); Port Clarence, 21 July, 1895, *Sharp* (Phil. Acad. Nat. Sci. Herb.);

Cape Nome, coll. of 1890, *Blaisdell* (Gray Herb.); vicinity of Nome, *Powers 6* (Field Mus. Herb.); Cape Vancouver, 9 Aug., 1891, *Macoun* (Geol. Surv. Canada Herb., Gray Herb., and Mo. Bot. Gard. Herb.); Kuskokwim Valley, coll. of 1884, *Weimmann* (Gray Herb.), branched form; Unga and Shumagin Islands, U. S. Coast Survey, 1871–72, *Harrington* (Gray Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.).

Var. **columbiensis** Gray, Syn. Fl. N. Am. 1^2:390. 1884, and ed. 2, 1886; Macoun, Cat. Canadian Pl. 267. 1884.

S. hyperborealis var. *columbiensis* (Gray) Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Ann. Mo. Bot. Gard. **1**:264. 1914.

Stems about 2 dm. high, one to several from a common base; heads subdiscoid, namely, with inconspicuous ray-flowers shorter than the bracts of the involucre.

Distribution: British Columbia.

Specimen examined:

British Columbia: Mucklung River, 25 July, 1882, *Mackay* (Gray Herb.), TYPE.

40. S. ovinus Greene, Pittonia **4**:110. 1900; Blankenship, Mont. Agr. Coll. Sci. Studies **1**:103. 1904.

S. resedifolius Rydb. Mem. N. Y. Bot. Gard. **1**:447. 1900, not Less.

A low herbaceous perennial, glabrous or somewhat tawny, floccose-tomentulose in the axils of the leaves; stems one to several from an ascending stoutish rootstock, .5 to 2 dm. high, erect or nearly so; lower leaves broadly ovate to obovate, occasionally sublyrate, including the petiole 1 to 6 cm. long, the blade .5 to 3 cm. long, .3 to 2.5 cm. broad, subentire to crenate-dentate, glabrous, thickish in texture; upper leaves sessile, laciniate to entire; heads usually solitary, occasionally two, 8 to 10 mm. high, radiate; involucre companulate, sparingly calyculate; bracts of the involucre about 21, linear-lanceolate, acuminate, acute, 7 to 8 mm. long, often purplish; ray-flowers 13 to 21, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of Alberta to Wyoming.

Specimens examined:

Alberta: high slopes of Sheep Mountain, Waterton Lake, 29 July, 1895, *Macoun 11619* (Geol. Surv. Canada Herb., Gray Herb., photograph in Field Mus. Herb. and Mo. Bot. Gard. Herb.), TYPE.

British Columbia: near the western summit of North Kootenai Pass, 26 July, 1883, *Dawson* (Geol. Surv. Canada Herb. 14826 in part, and Greene Herb.).

Montana: McDonalds Peak, Mission Range, alt. 2440 m., 19 July, 1883, *Canby 36* (Gray Herb.); Stanton Lake, 1 Aug., 1894, *Williams 1022* (Gray Herb., U. S. Nat. Herb., and Mont. Agr. Coll. Herb.); Mt. Hyalite, alt. 3000 m., 1 Aug., 1902, *Blankenship* (Gray Herb.); Sperry Glacier, 1 Sept., 1903, *Umbach 798* (Field Mus. Herb.); Sperry Glacier, alt. 2440 m., 1 Sept., 1903, *Blankenship* (Gray Herb.); MacDougal Park, Flathead Lake and vicinity, 31 July, 1908, *Clemens* (Field Mus. Herb. and Mo. Bot. Gard. Herb.); Glacier National Park, 11 July, 1914, *Hitchcock 11962* (U. S, Nat. Herb.).

Wyoming: Wind River Mountains, alt. 2700–3000 m., "*C.R.*" (Gray Herb.).

41. S. conterminus Greenm. nom. nov.

S. Lyallii Klatt in Annal. Naturhist. Hofm. Wein **9**:365. 1894, not Hook. f.; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

A low depressed somewhat cespitose herbaceous perennial, conspicuously white-floccose tomentose at the base and in the axils of the leaves; stems erect or nearly so, 4 to 8 cm. high from a stout rootstock; leaves thickish, the lower ovate-rotund to oblong-spatulate or occasionally sublyrate, crenate-dentate to obtusely lobed, including the petiole 1 to 3 cm. long, 1 cm. or less broad; stem-leaves sessile, laciniate, the uppermost reduced to entire purplish-tipped bracts; heads usually solitary, 10 to 14 mm. high, radiate; involucre campanulate, calyculate, floccose-tomentulose at the base, glabrous above; bracts of the involucre about 21, linear-lanceolate, acuminate, 8 to 10 mm. long, somewhat penicillate, and more or less tinged with purple; ray-flowers 10 to 12, rays yellow; disk-flowers numerous, slightly exceeding the involucre; achenes glabrous.

Distribution: Rocky Mountains, near the Canadian boundary, northward into Alberta and British Columbia.

Specimens examined:

Rocky Mountain summits, alt. 2130–2440 m., Oregon Boundary Commission, coll. of 1861, *Lyall* (Gray Herb., Kew Herb., and Berlin Herb.), TYPE.

Alberta: Sheep Mountain, Waterton Lake, 28–31 July, 1895, *Macoun* (Kew Herb., Berlin Herb., and U. S. Nat. Herb. 289213); on the summit of Moose Mountain, alt. 2285 m., 29 June–1 July, 1897, *Macoun 22781, 22773* (Geol. Surv. Canada Herb.); on high mountain slopes, Crows Nest Pass, alt. 1825–2285 m., 2 Aug., 1897, *Macoun 22782, 22783* in part (Geol. Surv. Canada Herb.).

British Columbia: north summit of North Kootenai Pass, coll. of 26 July, 1883, *Dawson* (Geol. Surv. Canada Herb. 14826 in part).

42. S. hesperius Greene, Pittonia **2**:166. 1891. Pl. 3, fig. 1.

S. hesperis Howell, Fl. Northwest Am. **1**:375. 1900.

S. pyroloides Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

S. auleticus Greene, Leafl. Bot. Obs. & Crit. **2**:15. 1909.

A slender herbaceous perennial; stem erect, 1 to 2 dm. high, floccose-tomentulose, especially at the base and in the axils of the leaves, later more or less glabrate, obovate-rotund to oblanceolate, including the petiole 1 to 6 cm. long, .5 to 1.8 cm. broad, entire to crenate-dentate, narrowed at the base into a petiole equalling or much exceeding the blade, at first tomentulose soon glabrate; stem-leaves sessile, laciniate to linear-attenuate; heads usually solitary, occasionally two, rarely five, 10 to 12 mm. high, radiate; involucre campanulate, sparingly calyculate, slightly tomentulose to glabrous; bracts of the involucre 13 to 21, linear-lanceolate, 5 to 8 mm. long; rays yellow; disk-flowers rather numerous; achenes glabrous.

Distribution: southwestern Oregon.

Specimens examined:

Oregon: Eight Dollar Mountain, May, 1884, *Howell 160* (Gray Herb.); near Kirbyville, 27 May, 1884, *Howell 1511*

(Greene Herb., U. S. Nat. Herb., Torrey Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb), TYPE; Eight Dollar Mountain, 13 June, 1904, *Piper 6145* (U. S. Nat. Herb.); eight miles south of Waldo, 14 June, 1904, *Piper 6254* (U. S. Nat. Herb.).

43. S. Newcombei Greene, Pittonia **3**:249. 1897.

A slender herbaceous perennial, glabrous throughout; stem solitary, erect or nearly so, 1.5 to 2 dm high; leaves thin, the lower petiolate, reniform to obovate in general outline, 3 to 7-lobate-dentate, 1 to 1.5 cm. long, 1 to 2 cm. broad, subcordate to abruptly narrowed at the base into a slender petiole, the lobes ovate-oblong, mucronate; upper leaves cuneate to linear; heads solitary, radiate, about 1 cm. high; involucre subcampanulate, ecalyculate, glabrous; bracts of the involucre 8 to 13, lanceolate, 6 to 8 mm. long, acute; ray-flowers 10 to 12, rays narrowly oblong, 1 to 1.5 cm. long, 2 to 4 mm. broad, in the dried state more or less tinged with lilac; disk-flowers rather numerous; achenes striate, glabrous.

Distribution: known only from Queen Charlotte Islands.

Specimens examined:

British Columbia: Kaitgoro, west coast of Moresby Island, Queen Charlotte Islands, 28 June, 1897, *Newcombe* (Greene Herb., Geol. Surv. Canada Herb. 18707, and Kew Herb., tracing in Gray Herb.), TYPE; in the same locality, coll. of 1903, *Newcombe* (Field Mus. Herb. and Gray Herb.).

This species is known only from its original station, and while it exhibits certain characteristics not common in *Senecio*, yet it has the technical floral characters of this genus.

44. S. subnudus DC. Prodr. **6**:428. 1837; Nutt. in Trans. Am. Phil. Soc. **7**:412. 1841; Torr. & Gray, Fl. N. Am. **2**:445. 1843; Howell, Fl. Northwest Am. 378. 1900; Rydb. Mem. N. Y. Bot. Gard. **1**:447. 1900, and Bull. Torr. Bot. Club **27**:184. 1900; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Piper, Contr. U. S. Nat. Herb. **11**:597. 1906; Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909.

S. aureus var. *subnudus* Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886; Macoun, Cat. Canadian Pl. 266. 1884.

S. cymbalarioides Buek, Ind. DC. Prodr. pt. 2, p. vi. 1840, not Nutt.

A slender herbaceous perennial, glabrous throughout; stem simple, erect, 1 to 3.5 dm. high, rising from a slender root-stock; leaves thin, membranous, the lower petiolate, sub-rotund-obovate, occasionally sublyrate, including the petiole .5 to 9 cm. long, .5 to 3 cm. broad, abruptly to gradually narrowed at the base, crenate-dentate; the upper leaves sessile, incised to entire; heads solitary or occasionally two, 8 to 10 mm. high, including the yellow rays 1.5 to 2.5 cm. in diameter; bracts of the involucre about 21, linear-lanceolate, acute, glabrous and often purplish, slightly shorter than the rather numerous flowers of the disk; achenes glabrous.

Distribution: Montana and Wyoming to Washington and California.

Specimens examined:

Montana: bogs, Park Co., alt. 2800 m., Aug., 1897, *Tweedy 344* (Mont. Agr. Coll. Herb.); in open bogs among the hills, West De Lacy Creek, 4 Aug., 1899, *A. & E. Nelson 6300* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Old Hollowtop, near Pony, alt. 2740 m., 7 July, 1897, *Rydberg & Bessey 5270* (Gray Herb., U. S. Nat. Herb., Field Mus. Herb., and Mont. Agr. Coll. Herb.).

Yellowstone National Park: Upper Falls of the Yellowstone, Hayden's U. S. Geol. Survey, 1871, *Adams* (U. S. Nat. Herb.); in bogs, alt. 2740 m., Aug., 1885, *Tweedy 720* (U. S. Nat. Herb. 143107, and Field Mus. Herb.).

Rocky Mountains: Lat. 49° N., alt. 1980 m., Oregon Boundary Commission, 1861, *Lyall* (Gray Herb.).

Wyoming: without definite locality or date of collection, *Tweedy 585* (U. S. Nat. Herb. 48711); Wind River Chain of Rocky Mountains, alt. 2135 m., *Fremont* (Gray Herb.).

Idaho: ridges south from Wiessner's Peak, alt. 1900 m., 27 July, 1895, *Leiberg 1376* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Bear Creek Cañon, alt. 1500 m., 1 Sept., 1897, *Leiberg 2968* (U. S. Nat. Herb.).

Washington: Horse Shoe Basin, Okanogan Co., Sept., 1897, *Elmer 1423* (Mo. Bot. Gard. Herb.); Yakima region,

Northern Transcontinental Survey, coll. of 1882, *Brandegee 118* (Mo. Bot. Gard. Herb.) and *915* (Gray Herb.); wet meadows, Chiquash Mountains, Skamania Co., 18 Aug., 1892, *Suksdorf 2167* (Gray Herb., U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); north of Mt. Adams, Aug., 1892, *Henderson 2308* (Gray Herb.); wet meadows, alt. about 2000 m., Mt. Paddo (Adams), 3 Sept., 1904, *Suksdorf 4241* (U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.).

Oregon: Eagle Creek Mountains, Union Co., alt. 2440 m., Aug., 1881, *Cusick 938, 959* (Gray Herb.); wet meadows of the highest mountains, eastern Oregon, coll. of 1897, *Cusick 1804* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); granitic soil, swampy meadows, North Catherin Creek, eastern Oregon, alt. 1500 m., 26 July, 1907, *Cusick 3177* (U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); sedgy meadow, Wallowa Mountains, source of Kettle Creek, alt. 2285 m., 12 Aug., 1909, *Cusick 3379* (U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); "Cascade Mountains on the Oregon" *(Douglas?) Dr. Gairdner* (Gray Herb.); without locality, coll. of 1871, *Hall 304* (Gray Herb. and Mo. Bot. Gard. Herb.); base of Mt. Hood, June, 1878, *J. & S. J. Howell* (Field Mus. Herb.); Mt. Hood, alt. 1220 m., 25–26 Aug., 1914, *Hitchcock 12328* (U. S. Nat. Herb.); Cascade Mountains, Aug., 1880, *Howell* (U. S. Nat. Herb. 48811, and Field Mus. Herb.).

California: Plumas Co., coll. of 1876, *Mrs. Austin* (Gray Herb. and Field Mus. Herb.); summit of Mt. Dana, coll. of 1878, *Lemmon* (Gray Herb.); Pine Creek, July, 1912, *Baker* (Field Mus. Herb.).

45. S. Rosei Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Field Col. Mus. Bot. Ser. **2**:276. 1907. Pl. 3, fig. 2.

An herbaceous perennial; stem solitary, erect, 4 to 4.5 dm. high, simple, glabrous below, slightly pubescent above, terminated by a single large radiate head; lower leaves petiolate, ovate, 2 to 3 cm. long, two-thirds as broad, obtuse, subentire to crenate-dentate, thin, glabrous on both surfaces; petioles

2.5 to 8 cm. long; upper stem-leaves sublaciniate and somewhat ampliated at the base and partly clasping the stem; heads about 12 mm. high, including the rays 3 to 3.5 cm. in diameter; involucre campanulate, essentially ecalyculate; bracts of the involucre lanceolate-linear, 8 to 10 mm. long, acute, glabrous; ray-flowers 10 to 12, rays light yellow, conspicuous; disk-flowers numerous; achenes glabrous.

Distribution: west central Mexico.

Specimen examined:

Territory of Tepic: Sierra Madre, near Santa Teresa, 10 Aug., 1897, *Rose 2157* (Gray Herb. and U. S. Nat. Herb.), TYPE.

46. S. Porteri Greene, Pittonia **3**:186. 1897; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Rydb. Fl. Colo. 397. 1906.

S. renifolius Porter in Porter & Coulter, Syn. Fl. Colo. 83. 1874, not Schz. Bip.; Gray, Syn. Fl. N. Am. 1^2:389. 1884, and ed. 2, 1886; Coulter, Manual Rocky Mountain Region 210. 1885.

A low herbaceous perennial, glabrous throughout and more or less tinged with purple; stems ascending from a slender rootstock, 1 dm. or less high; leaves petiolate, mostly reniform, including the petiole 1.5 to 5 cm. long, .8 to 2.5 cm. broad, crenate; heads about 14 mm. high, solitary on nearly naked peduncles, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre about 13, linear-lanceolate, acute, 10 mm. long, purplish; ray-flowers 8 to 10, rays bright yellow; disk-flowers numerous; achenes glabrous.

Distribution: high mountains of Colorado and eastern Oregon.

Specimens examined:

Colorado: White House Mountain, alt. 3960 m., Hayden's U. S. Geol. Survey, 9 Aug., 1873, *Coulter 2950* (Gray Herb., Phil. Acad. Nat. Sci. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.).

Oregon: alpine ridges of the Wallowa Mountains, 3 Aug., 1899, *Cusick 2308* (Gray Herb., Kew Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.).

47. **S. Soldanella** Gray, Proc. Acad. Nat. Sci. Phil. **15**:67. 1863; Porter & Coulter, Syn. Fl. Colo. 83. 1874; Gray, Syn. Fl. N. Am. **1**[2]:384. 1884, and ed. 2, 1886; Coulter, Manual Rocky Mountain Region 206. 1885; Rydb. Fl. Colo. 394. 1906; Coulter & Nelson, Manual Cent. Rocky Mountains 578. 1909; Clements & Clements, Rocky Mountain Fls. 291. 1914.

S. Grayi Parry ex Gray, Proc. Acad. Nat. Sci. Phil. **15**:67. 1863, not *S. Greyi* Hook. f.

A low herbaceous perennial, 1 to 2 dm. high, glabrous throughout and more or less tinged with purple; stems flexuous, ascending from a stoutish rootstock, the latter bearing numerous fleshy-fibrous roots; leaves somewhat succulent, subrotund to oblong-obovate, 1.5 to 5.5 cm. broad, entire to sinuate-dentate, subcordate or more frequently cuneate at the base into a winged petiole much exceeding the blade; heads large, 1.5 to 2 cm. high, usually solitary, radiate; involucre broadly campanulate, calyculate; bracts of the involucre narrowly lanceolate, 10 to 14 mm. long, pubescent-tipped, otherwise glabrous and purplish; ray-flowers 10 to 18, rays yellow; disk-flowers very numerous; achenes strongly ribbed, glabrous.

Distribution: high mountains of Colorado.

Specimens examined:

Colorado: Gray's Peak, 1 Aug., 1862, *Parry* (Gray Herb., Kew Herb., and Mo. Bot. Gard. Herb.), TYPE; Lat. 39°41′ N., coll. of 1862, *Hall & Harbour 319* (Gray Herb., Kew Herb., U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); South Park, alt. 3960 m., Lieut. Wheeler's Expedition, 1873, *Wolf & Rothrock 573, 575* (Gray Herb. and U. S. Nat. Herb.); Mt. La Plata, alt. 4265 m., Hayden's U. S. Geol. Survey, 1873, *Coulter* (Gray Herb. and Field Mus. Herb.); Sangre de Cristo, Aug., 1873, *Brandegee 724* (U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Sawatche Range, coll. of 1880, *Brandegee* (Mo. Bot. Gard. Herb.); high mountains, Gray's Peak and vicinity, alt. 3350–4265 m., Aug., 1885, *Patterson 84* (Gray Herb., Kew Herb., U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); Gray's Peak, alt.

4265 m., 21 July, 1886, *Letterman 67* (Mo. Bot. Gard. Herb.); Gray's Peak, July, 1888, *Eastwood* (U. S. Nat. Herb.); Mt. Baldy, alt. 3655 m., 11 July, 1891, *Smith* (Mo. Bot. Gard. Herb.); Mt. Princeton, alt. 2115 m., 21 July, 1892, *Sheldon 172, 491* (U. S. Nat. Herb.); stony slopes of Sheep Mountain, alt. 4225 m., coll. of July, 1893, *Purpus 680* (Field Mus. Herb.); La Plata Mountains, alt. 3350–3600 m., 15 July, 1896, *Tweedy 536* (U. S. Nat. Herb.); Cameron Pass, alt. 3600 m., 16 July, 1896, *Baker* (Mo. Bot. Gard. Herb.); Cumberland Mine, La Plata Mountains, alt. 3750 m., 15 July, 1898, *Baker, Earle & Tracy 534* (Gray Herb., Kew Herb., U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); Mt. Baldy, near Breckenridge, alt. 3960 m., Aug., 1901, *Mackenzie 164* (Phil. Acad. Nat. Sci. Herb. and Mo. Bot. Gard. Herb.).

48. S. obovatus Muhl. ex.Willd. Sp. Pl. **3**:1999. 1804; Pursh, Fl. Am. Sept. **2**:530. 1814, and ed. 2, 1816; Nutt. Gen. **2**:165. 1818; Ell. Sketch 329. 1824; Eaton, Manual of Botany 454. 1824; DC. Prodr. **6**:432. 1837; Heller, Cat. N. Am. Pl. 146. 1898, and ed. 2, 230. 1900; Britton & Brown, Ill. Fl. **3**:478, *fig. 4041*. 1898, and ed. 2, 545, *fig. 4627*. 1913; Britton, Manual 1027. 1901, and ed. 2, 1905; Greenm. Rhodora **3**:5. 1901; Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Porter, Fl. Penn. 339. 1903; Keller & Brown, Handb. Fl. Phil. and Vicinity 343. 1905; Small, Fl. Southeastern United States 1304. 1903, and ed. 2, 1913; Greenm. in Gray, Manual, ed. 7, 854. 1908; Graves et al. Conn. Geol. and Nat. Hist. Surv. Bull. No. 14, p. 404. 1910; Small & Carter, Fl. Lancaster County 310. 1913.

S. obtusatus Banks ex Pursh, Fl. Am. Sept. **2**:530. 1814, and ed. 2, 1816; DC. Prodr. **6**:432. 1837.

S. Elliottii Torr. & Gray, Fl. N. Am. **2**:443. 1843; Chapman, Fl. Southern U. S., ed. 1, 245. 1860, and ed. 2, 1889.

S. aureus var. *obovatus* Torr. & Gray, Fl. N. Am. **2**:442. 1843; Gray, Syn. Fl. N. Am. 1^2:391. 1884, and ed. 2, 1886; Macoun, Cat. Canadian Pl. 265. 1884, in part; Chapman, Fl. Southern U. S., ed. 3, 266. 1897.

An herbaceous perennial, glabrous or slightly tomentulose; stems erect, 2 to 5 dm. high, simple or branched, often stoloni-

ferous at the base; stolons slender and elongated to short and rather stout; lower leaves petiolate, obovate, oblong-ovate to subrotund, 1 to 10 cm. long, two-thirds to nearly or quite as broad, rounded at the apex, crenate to doubly serrate, gradually narrowed at the base and decurrent on the petiole or abruptly contracted to a subcordate base; stem-leaves petiolate and sublyrate to sessile, more or less pinnatisect and semiamplexicaul; inflorescence a terminal several to many-headed corymbose cyme; heads 8 to 10 mm. high, radiate; ray-flowers 8 to 12, rays relatively long and narrow, yellow; disk-flowers numerous; achenes glabrous or occasionally hispidulous along the angles.

Distribution: Vermont, south to Georgia, west to Missouri, Kansas, and Texas.

Specimens examined:

Vermont: Pownal, Bennington Co., 31 July, 1898, *Eggleston 264* (Gray Herb.), and 8–11 Sept., 1899, *Eggleston 1381* (U. S. Nat. Herb.).

Massachusetts: Ipswich, coll. of 1842, *Oakes* (Gray Herb. and U. S. Nat. Herb.); Boxford, 22 June, 1878, *E. Faxon* (Gray Herb.); Alford, *Milligan* (U. S. Nat. Herb.); without definite locality, *Nuttall* (Phil. Acad. Nat. Sci. Herb.).

Connecticut: shaded limestone ledges, Salisbury, 3 June, 1901, *Bissell* (Gray Herb.); in loam and on calcareous ledges, Salisbury, 30 May, 1902, *Churchill, Bissell & Fernald 96* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); near Southington, 24 Aug., 1903, *Andrews* (Gray Herb.); Meriden Mountain, 30 May, 1885, *Safford 344* (U. S. Nat. Herb.); rich dry rocky woods, Monroe Co, 8 June, 1895, *Eames* (U. S. Nat. Herb.); thin dry woods on ledge of trap rock, Long Hill, 26 May, 1894, *Eames* (Gray Herb.); Bridgeport, 19 May, 1893, *Eames* (U. S. Nat. Herb.).

New York: Lebanon Springs, 31 May, 1890, *Harrison 9* (U. S. Nat. Herb.); West Point, *ex Herb. Thurber* (Gray Herb.); Van Cortlandt, May, 1893, *Pollard* (U. S. Nat. Herb.); Delaware Co., 6 July, 1892, *H. von Schrenk* (Mo. Bot. Gard. Herb.); without definite locality, *Torr. & Gray, Fl. N. Am.* (Gray Herb.).

New Jersey: dry soil, Cranberry Lake, Sussex Co., 9 June, 1907, *Mackenzie 2616* (U. S. Nat. Herb.); Budd's Lake, Morris Co., 29 May, 1895, *Heritage,* in part, and 30 May, 1895, *Lippincott,* in part (Phil. Acad. Nat. Sci. Herb.); rocky banks, near Charlotteburg, Morris Co., 24 May, 1908, *Mackenzie 3089* (Mo. Bot. Gard. Herb.); above Phillipsburg, Warren Co., 18 May, 1907, *Van Pelt & Long* (Phil. Acad. Nat. Sci. Herb.).

Pennsylvania: Stroudsburg, 2 June, 1900, *ex Herb. Canby* (Phil. Acad. Nat. Sci. Herb.); Bartonsville, 1 July, 1907, *Long & Bartram* (Phil. Acad. Nat. Sci. Herb.); side of Pocono Knob, 31 May, 1902, *Brown* (Phil. Acad Nat. Sci. Herb.); Easton, *Trail Green* (Gray Herb.); Buckskill Falls, 31 May, 1897, *Brown* (Phil. Acad. Nat. Sci. Herb.); Hellertown, 1 June, 1849, *ex Herb. Detwiller* (Phil. Acad. Nat. Sci. Herb.); along Jordan Creek, Lehigh Co., 14 May, 1911, *Pretz 3336* (Phil. Acad. Nat. Sci. Herb.); Nockamixon, 28 May, 1893, *MacElwee,* in part, 19 May, 1906, *Van Pelt & Long,* 26 May, 1902, *Fretz,* and 4 June, 1894, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Nockamixon Rocks, 30 May, 1893, *N. L. Britton* (U. S. Nat. Herb.); Narrowsville, 30 May, 1893, *Brown* (Phil. Acad. Nat. Sci. Herb.); Ivy Rock, below Norristown, 9 May, 1896, *Keller,* and 6 May, 1906, *Van Pelt* (Phil. Acad. Nat. Sci. Herb.); Pennsburg, 20 June, 1910, *Mumbauer 255* (Phil. Acad. Nat. Sci. Herb.); Arcola, *ex Herb. Crawford* (Phil. Acad. Nat. Sci. Herb.); Phoenixville, June, 1865, *ex Herb. Martindale,* and 25 April, 1909, *Bartram* (Phil. Acad. Nat. Sci. Herb.); near Philadelphia, *Griffith 30* (Phil. Acad. Nat. Sci. Herb.); Philadelphia, *ex Herb. Bernhardi* (Mo. Bot. Gard. Herb.); Schuylkill, 5 May, 1834, collector not indicated (Phil. Acad. Nat. Sci. Herb.); Lafayette and Sumneytown, *Williamson* (C. S. Williamson Herb.); in limestone on the Conestoga near Danville Pike Crossing, 17 May, 1901, *Heller* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Conestoga, April, 1889, *Eby* (Mo. Bot. Gard. Herb.); Mountville, Lancaster Co., April, 1889 and 1890, *Eby* (Mo. Bot. Gard. Herb.); McConnellsburg, Fulton Co., 3 June, 1905, *Stone 234* (Phil. Acad. Nat. Sci. Herb.); Johnstown, Cambria Co., *Williams* (C. S.

Williamson Herb.), and 16 June, 1907, *Bartram* (Phil. Acad. Nat. Sci. Herb.); Homewood, 15 June, 1907, *Bartram* (Phil. Acad. Nat. Sci. Herb.); Ohiopyle, Fayette Co., 3–8 July, 1905, *Brown, Crawford & Van Pelt 22, 135* (Phil. Acad. Nat. Sci. Herb.).

Virginia: Great Falls of the Potomac, 21 April, 1908, *Williamson* (Phil. Acad. Nat. Sci. Herb.); on limestone cliffs at edge of river near Schulers, west of Luray, Page Co., 10 May, 1904, *G. S. Miller* (U. S. Nat. Herb.); about Mt. Crawford, Rockingham Co., alt. 365–455 m., 5–13 May, 1893, *Heller* (U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); bluffs of Middle Fork of Holston River, near Marion, Smyth Co., alt. 640 m., 22 May, 1892, *Small* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); vicinity of Marion, 22 May, 1892, *N. L. and E. G. Britton & Vail* (Phil. Acad. Nat. Sci. Herb.).

North Carolina: rocky woods, Hewitt's Station, Swain Co., 24 May, 1897, *Biltmore Herb. 3364a* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Hot Springs and Warm Springs, 24 April, 1887, *Aubrey H. Smith* (Phil. Acad. Nat. Sci. Herb.).

South Carolina: slopes of Paris Mountain, Greenville, 2 April, 1908, *Mackenzie* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.), tomentulose form.

Georgia: bluffs, Rome, coll. of 1882, *ex Herb. Chapman* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.), a form approaching the variety *rotundus*.

Alabama: Boykin, *Buckley* (Gray Herb.); Moulton, Lawrence Co., *Mohr* (U. S. Nat. Herb.); without definite locality, *Wilkinson* (U. S. Nat. Herb.).

West Virginia: White Sulphur Springs, 17–18 May, 1909, *Eggleston 4346* (Mo. Bot. Gard. Herb.); Fairmont, May, 1907, *Williamson* (C. S. Williamson Herb.).

Ohio: near Canton, May, 1875, *ex Herb. Riddell 149* (Mo. Bot. Gard. Herb.); river banks, Lorain Co., 21 April, 1890, *Kofoid* (Mo. Bot. Gard. Herb.); Huron River, Erie Co., *Moseley* (Gray Herb.); Oxford, 2 June, 1908, *Overholts* (Mo. Bot. Gard. Herb.).

Indiana: around lakes, Wells Co., 11 May, 1903, *Deam* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); river bank, north of Notre Dame, 6 June, 1911, *Nieuwland 2660,* and 15 May, 1913, *Nieuwland 11114* (Mo. Bot. Gard. Herb.); Worthington, 29 April, 1889, *Evermann* (U. S. Nat. Herb.).

Kentucky: beargrass hills near Louisville, 20 May, 1853, *Mohr* (U. S. Nat. Herb.); without definite locality, *ex Herb. Short* (Phil. Acad. Nat. Sci. Herb.).

Tennessee: rich bluffs, Knoxville, May, 1896, *Ruth (2)* and in woods, near Knoxville, June, 1896, *Ruth 5* (Mo. Bot. Gard. Herb.); Knoxville, 5 May, 1895, *J. G. Smith* (Mo. Bot. Gard. Herb.); moist woods, Cumberland Mountain, 5 May, 1898, *Eggert* (Mo. Bot. Gard. Herb.); cedar glades, near Lavergne, 4 May, 1898, *Eggert* (Mo. Bot. Gard. Herb.).

Missouri: Jerome, colls. of 1913 and 1914, *J. H. Kellogg 56, 58, 90, 452* (Mo. Bot. Gard. Herb.); Swan, 21 April, 1907, *Bush 4203* (Mo. Bot. Gard. Herb.); Monteer, 12 May, 1901, *Bush 429,* and 14 May, 1905, *Bush 2836* (Mo. Bot. Gard. Herb.); on bluffs, Neck City, Jasper Co., 12 May, 1912, *E. J. Palmer 3669* (Mo. Bot. Gard. Herb.).

Arkansas: Independence, 23 April, 1896, *Eggert* (Mo. Bot. Gard. Herb.); Eureka Springs, 20 April, 1899, *Trelease* (Mo. Bot. Gard. Herb.); Hartford Station, April, 1903, *Pilsbury* (Phil. Acad. Nat. Sci. Herb.); Petit Jean, Yell Co., 1 and 2 April, 1903, *Pilsbury* (Phil. Acad. Nat. Sci. Herb.).

Oklahoma: Vinita, 23 April, 1891, *Carleton 19* (U. S. Nat. Herb.); on creek bank, Page, Leflore Co., 20 April, 1915, *Blakeley 3443* (Mo. Bot. Gard. Herb.).

Texas: river banks, Denison, 28 March, 1890, *Bodin 27* (U. S. Nat. Herb.); near Austin, 17 March, 1908, *York* (Mo. Bot. Gard. Herb.).

Var. **divisifolius** Greenm. var. nov.

Stems bearing short stout stolons; lower leaves obovate to narrowly oblong-oblanceolate, those of the stem relatively long and conspicuously pinnatisect. A local but striking variation from the type.

Distribution: bluffs near Knoxville, Tenn.

Specimens examined:

Tennessee: rich woods, Knoxville, April, 1898, *Ruth 705* (Mo. Bot. Gard. Herb.), TYPE; bluffs, Knoxville, April, 1898, *Ruth 674* (U. S. Nat. Herb.); bluffs, Knoxville, May, 1896, *Ruth (3)* (Mo. Bot. Gard. Herb.); vicinity of Knoxville, 29 April, 1890, *Lamson-Scribner* (U. S. Nat. Herb.).

Var. **elongatus** (Pursh) Britt. in Britton & Brown, Ill. Fl. **3**:478. 1898; Britton, Manual 1027. 1901, and ed. 2, 1905; Porter, Fl. Penn. 339. 1903; Keller & Brown, Handb. Fl. Phil. and Vicinity 343. 1905; Greenm. Monogr. Senecio, I. Teil, 24. 1901, in Engl. Bot. Jahrb. **32**:20. 1902, and in Gray, Manual, ed. 7, 854. 1908.

S. elongatus Pursh, Fl. Am. Sept. **2**:529. 1814, and ed. 2, 1816.

S. aureus var. *discoidea* Porter in herb., not *S. aureus* var. *discoideus* Hook.

Habit and foliage of the species; peduncles of the inflorescence relatively long; heads discoid.

Distribution: eastern Pennsylvania and New Jersey.

Specimens examined:

New Jersey: Budd's Lake, Morris Co., 29 May, 1895, *Heritage,* in part, and 30 May, 1895, *Lippincott,* in part (Phil. Acad. Nat. Sci. Herb.).

Pennsylvania: vicinity of Easton, coll. of 1807, *Pursh, ex Herb. Lambert* (Gray Herb.); College Hill, Easton, June, 1867, *Porter* (Gray Herb.); College Hill, 1 June, 1868, *Porter,* and coll. of 1868, *Garber* (Phil. Acad. Nat. Sci. Herb.); College Hill, June, 1870, *Porter* (U. S. Nat. Herb.); College Hill, May, 1871, *Porter* (Mo. Bot. Gard. Herb.); Spruce Hill on Bushkill Creek, 25 May, 1887, *Porter* (Phil. Acad. Nat. Sci. Herb.); College Hill, 12 May, 1890, *Porter* (Gray Herb. and U. S. Nat. Herb.); Nockamixon, Bucks Co., 28 May, 1893, MacElwee (Phil. Acad. Nat. Sci. Herb.), in part; College Hill, 17 May, 1895, *Porter* (Phil. Acad. Nat. Sci. Herb.); limestone bluffs on the Bushkill, 5 May, 1899, *Porter* (Phil. Acad. Nat. Sci. Herb.); "hillsides, near the Schuylkill and Susquehanna", *ex. Herb. David Townsend* (Phil. Acad. Nat. Sci. Herb.).

Var. **rotundus** Britt. in Britton & Brown, Ill. Fl. **3**:479. 1898. Britton, Manual 1027. 1901, and ed. 2, 1905; Greenm. Monogr. Senecio, I. Teil, 24. 1901, in Engl. Bot. Jahrb. **32**:20. 1902, and in Gray, Manual 854. 1908; Blankenship in Mo. Bot. Gard. Ann. Rept. **18**:179. 1907.

S. rotundus Small, Fl. Southeastern U. S. 1304. 1903, and ed. 2, 1913.

S. Lindheimeri Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

Habit, inflorescence, and technical characters of the head like the species; basal leaves usually long-petioled, the blade obovate to subrotund, cuneate to abruptly constricted into a subcordate base.

Distribution: Ohio to eastern Kansas and south to Louisiana and Texas.

Specimens examined:

Ohio: Oak Point, Lorain Co., 11 May, 1895, *Ricksecker* (U. S. Nat. Herb.); Franklin Co., 7 May, 1892, *Werner 133* (Gray Herb.); central Ohio, *Sullivant* (Gray Herb.); vicinity of Miami, coll. of 1835, *Dr. Frank* (Mo. Bot. Gard. Herb.); Dayton, collector not indicated (Gray Herb.); near Cincinnati, *Lloyd* (Mo. Bot. Gard. Herb.).

Missouri: flood plain of Fox Creek, near Allenton, St. Louis Co., 25 May, 1914, *Drushel* (Mo. Bot. Gard. Herb. and J. A. Drushel Herb.); wet places near Glencoe, 22 May, 1879, *Eggert* (Mo. Bot. Gard. Herb.); Meramec Highlands, 7 May, 1898, *Norton* (Mo. Bot. Gard. Herb.); Pacific, 24 May, 1915, *Drushel* (J. A. Drushel Herb.); Jefferson City, 6 May, 1866, *Krause* (Mo. Bot. Gard. Herb.); Kimmswick, 10 May, 1885, *Wislizenus 226* (Mo. Bot. Gard. Herb.), in part; Monteer, 11 May, 1905, *Bush 2822* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Pleasant Grove, 20 May, 1900, *Bush 340, 710* (Mo. Bot. Gard. Herb. and U. S. Nat. Herb.); near Webb City, 4 May, 1902, *E. J. Palmer 314* (Mo. Bot. Gard. Herb.); Oronogo, 13 and 30 May, 1906, *E. J. Palmer 859* (Mo. Bot. Gard. Herb.); La Russell, 22 May, 1908, *E. J. Palmer 1342* (Mo. Bot. Gard. Herb.); Prosperity, 11 May, 1909, *E. J. Pal-*

mer 1667 (Mo. Bot. Gard. Herb.); Alba, 30 May, 1909, *E. J. Palmer 1834* (Mo. Bot. Gard. Herb.); Carterville, 14 April, 1912, *E. J. Palmer 3521* (Mo. Bot. Gard. Herb.); Eagle Rock, 22 May, 1898, *Bush 262* (Mo. Bot. Gard. Herb.); open ground, McDonald Co., 24 May, 1891, *Bush 871* (Mo. Bot. Gard. Herb.); rich hillside woods, Noel, 4 May, 1914, *E. J. Palmer 5478* (Mo. Bot. Gard. Herb.).

Arkansas: Fulton, 18 April, 1901, *Sargent, Trelease & Bush 143* (Phil. Acad. Nat. Sci. Herb.); Texarkana, 6 April, 1905, *Bush 2241* (Mo. Bot. Gard. Herb.).

Louisiana: without definite locality, *Hale* (Gray Herb.).

Kansas: wet soil, Bourbon Co., 5 May, 1897, *Hitchcock 1118* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

Oklahoma: Sapulpa, 29 April, 1895, *Bush 976* (Mo. Bot. Gard. Herb.).

Texas: San Augustine, *Crocket* (U. S. Nat. Herb. 500119); Livingston, Polk Co., 9 April, 1914, *E. J. Palmer 5189* (Mo. Bot. Gard. Herb.); Grand Saline, *Reverchon* (Mo. Bot. Gard. Herb.); Marshall, Harrison Co., 17 April, 1914, *E. J. Palmer 5285* (Mo. Bot. Gard. Herb.); Mill Creek bottom, Washington Co., 26 Feb., 1844, *Lindheimer* (Mo. Bot. Gard. Herb. and Gray Herb.); rich woods, Dallas, 13 March, 1901, *Reverchon 556* (Mo. Bot. Gard. Herb.); Gillespie Co., *Jermy* (Mo. Bot. Gard. Herb.); Comal Spring, New Braunfels, *Lindheimer 446* (Mo. Bot. Gard. Herb.); New Braunfels, colls. of 1850 and 1851, *Lindheimer 510, 958, 959, 960* (U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); New Braunfels, alt. 228 m., 17–19 April, 1903, *Pilsbury* (Phil. Acad. Nat. Sci. Herb.); without definite locality, *Wright* (Gray Herb.).

Var. **umbratilis** Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

Lower leaves petiolate, obovate, oblong-ovate to oblong-elliptic, 2 to 8 cm. long, 1.5 to 5.5 cm. broad, petioles 2 to 12 cm. long.

Distribution: occurring occasionally with the species, especially in shady places from Indiana and Virginia to Louisiana.

Specimens examined:

Indiana: without definite locality, *Clapp* (Gray Herb.), TYPE.

Virginia: shaded rocks, Bedford Co., 9 May, 1871, *A. H. Curtiss* (Gray Herb.).

Kentucky: flat wet barrens, Henderson Co., 5 May, 1842, *Short* (Phil. Acad. Nat. Sci. Herb.).

Tennessee: marsh, Jackson, 15 April, 1893, *Bain 421* (Gray Herb.).

Missouri: Monteer, 27 April, 1907, *Bush 4337* (Mo. Bot. Gard. Herb.).

Arkansas: in woods, Fulton, 15 April, 1902, *Bush 1356* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); on low ground, Fulton, 17 April, 1905, *Bush 2355* (Mo. Bot. Gard. Herb.); Judsonia, 15 May, 1877, *Reynolds* (Field Mus. Herb.); Texarkana, 16 May, 1901, *Trelease* (Mo. Bot. Gard. Herb.); without definite locality, *Dr. Pitcher* (Phil. Acad. Nat. Sci. Herb.).

49. **S. Cardamine** Greene, Bull. Torr. Bot. Club **8**:98. 1881; Gray, Syn. Fl. N. Am. **1**^{2}:390. 1884, and ed. 2, 1886; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Wooton & Standley, Contr. U. S. Nat. Herb. **19**:747. 1915.

A low herbaceous perennial, glabrous throughout or slightly tomentulose in the leaf-axils; roots fibrous; stems one to several from a stoutish rootstock, 1 to 3.5 dm. high; leaves mostly radical, petiolate, round-ovate, 1 to 5 cm. long and broad, deeply cordate, crenate, green above, purple-tinged beneath; petioles 2 to 9 cm. long; stem-leaves 1 to 3, more or less amplexicaul, the uppermost sessile and much reduced; heads few, 1 to 3, about 1 cm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre lanceolate, 6 to 8 mm. long; ray-flowers 8 to 10, rays yellow; disk-flowers numerous, achenes glabrous.

Distribution: mountains of southwestern New Mexico.

Specimens examined:

New Mexico: Mogollon Mountains, 25 April, 1881, *Greene* (Gray Herb., Greene Herb., Kew Herb., Torrey Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.), TYPE; Mogollon Mountains, Willow Creek, 8 Aug., 1900, *Wooton* (U. S. Nat. Herb. 739065).

50. S. cyclophyllus Greenm. Field Col. Mus. Bot. Ser. **2**:276. 1907.

An herbaceous perennial; stem simple, 3.5 to 5 dm. high, sparingly tawny tomentulose at the base and in the axils of the leaves, otherwise glabrous, striate, somewhat purplish; radical and lowermost stem-leaves subrotund, 4 to 7 cm. long, equally broad, deeply cordate, crenate-dentate, green and glabrous above, purple beneath, petioles 5 to 8 cm. long; upper stem-leaves sessile, amplexicaul, pinnately divided into narrowly obovate-cuneate, unequally dentate lateral divisions and a relatively large subreniform terminal division; inflorescence a terminal many-headed subcorymbose cyme; heads 7 to 9 mm. high, radiate; involucre campanulate, sparingly calyculate with minute bracteoles, glabrous; bracts of the involucre about 21, lance-linear, 5 to 6 mm. long, acute, more or less purple-tipped; ray-flowers about 13, rays yellow; disk-flowers 50 to 60; mature achenes 2 mm. long, hispidulous.

Distribution: northeastern Mexico.

Specimens examined:

Nuevo Leon: near Monterey, coll. of 1906, *Pringle 10230* (Gray Herb., photograph in Field Mus. Herb. and Mo. Bot. Gard. Herb.), TYPE; Cerro la Scilla, near Monterey, 20 March, 1902, *Nelson 6672* (Gray Herb.).

51. S. quebradensis Greenm.[1]

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[1]**Senecio quebradensis** Greenm. sp. nov., herbaceus perennis glabrus vel praesertim in axillis foliorum albo-floccosus; caule simplice vel ramoso 1.5–4 dm. alto striato glabro; foliis inferioribus petiolatis rotundo-ovatis vel oblongo-ovatis 1–6 cm. longis, 1–5 cm. latis plerumque cordatis crenato-dentatis utrinque glabris vel juventa parce floccoso-tomentulosis et mox glabratis subinde purpurascentibus; foliis inferioribus plus minusve pinnatisectis et amplexicaulibus; inflorescentiis terminalibus corymboso-cymosis; capitulis paucis vel numerosis 8–10 mm. altis radiatis; involucro campanulato calyculato glabro; bracteis involucri 13–21 lineari-lanceolatis 5–6 mm. longis acutis penicillatis; flosculis liguliferis 8–10, ligulis flavis; floribus disci numerosis; achaeniis valde costatis glabris.—Collected at Quebrada Honda, State of Durango, Mexico, 20 and 21 May, 1906, *Palmer 213* (Gray Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.), TYPE.

An herbaceous perennial, glabrous or white-floccose in the leaf-axils and on the margins of the petioles; stem simple or branched, 1.5 to 4 dm. high from a stout rootstock, striate, glabrous; lower leaves petiolate, round-ovate to ovate-oblong, 1 to 6 cm. long, 1 to 5 cm. broad, usually cordate, crenate-dentate, glabrous on both surfaces or slightly floccose-tomentulose in the early stages but soon glabrate; upper stem-leaves more or less pinnatisect and amplexicaul; inflorescence a subcorymbose cyme terminating the stem and branches, few to many-headed; heads 8 to 10 mm. high, radiate; involucre campanulate, calyculate, glabrous; bracts of the involucre 13 to 21, linear-lanceolate, attenuate, 5 to 6 mm. long; ray-flowers 8 to 10, rays pale yellow; disk-flowers rather numerous; achenes strongly ribbed, glabrous.

Distribution: western Mexico.

Specimens examined:

Durango: Quebrada Honda, 20–21 May, 1906, *Palmer 213* (Gray Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.), TYPE.

52. S. Pammelii Greenm.[1]

An herbaceous perennial, glabrous or slightly white-tomentulose in the axils of the leaves; stems erect, 2 to 4 dm. high, and, as well as the petioles, more or less purplish towards the base; lower leaves long-petiolate, rotund-ovate, 1 to 2.5 cm. long, nearly or quite as broad, shallowly cordate or subtruncate, crenate to nearly entire; upper stem-leaves petiolate and somewhat lyrate to sessile and pinnatisect to entire; inflo-

[1]**Senecio Pammelii** Greenm. sp. nov., herbaceus perennis ubique glabrus vel in axillis foliorum paululo albo-tomentulosus; caulibus erectis 2–4 dm. altis ad basin petiolis etiam plus minusve purpurascentibus; foliis inferioribus longi-petiolatis rotundo-ovatis 1–2.5 cm. longis et latis brevi-cordatis vel subtruncatis crenatis vel fere integris; foliis superioribus petiolatis et sublyratis vel sessilibus et pinnatisectis; inflorescentiis corymboso-cymosis; capitulis 7–10 mm. altis paucis vel pluribus radiatis; involucro campanulato calyculato; bracteis involucri 13–21 lineari-lanceolatis 5–6 mm. longis acutis glabris; flosculis liguliferis 10–12, ligulis flavis; floribus disci numerosis; achaeniis glabris.—Collected in Peterson Cañon, Peterson, Utah, alt. 2895 m., 19 July, 1902, *Pammel & Blackwood 3870* (Mo. Bot. Gard. Herb.), TYPE; on Ruby Mountains, near Blaine post-office, Elko Co., Nevada, alt. 2710 m., 27 Aug., 1913, *Heller 11096* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

This species may be looked for in herbaria under *S. aureus*, also under *S. rubricaulis* having been distributed under both names.

rescence a few to many-headed corymbose cyme; involucre campanulate, sparingly calyculate; heads 7 to 10 mm. high, radiate; bracts of the involucre 13 to 21, linear-lanceolate, 5 to 6 mm. long, acute, glabrous; ray-flowers 10 to 12, rays bright yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of Utah and Nevada.

Specimens examined:

Utah: moist rocks and shady woods, Peterson Cañon, Peterson, alt. 2895 m., 19 July, 1902, *Pammel & Blackwood 3870* (Mo. Bot. Gard. Herb.), TYPE.

Nevada: Ruby Mountains, near Blaine post-office, Elko Co., alt. 2710 m., 27 Aug., 1913, *Heller 11096* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

53. S. aureus L. Sp. Pl. **2**:870. 1753, ed. 2, 1220. 1763, and ed. 3, 1220. 1764; Michx. Fl. **2**: 120. 1803; Willd. Sp. Pl. **3**:1998. 1804; Pursh, Fl. Am. Sept. **2**:530. 1814, and ed. 2, 1816; Nutt. Gen. **2**:165. 1818; Ell. Sketch **2**:331. 1824; Bigel. Fl. Bost. 307. 1824; Sprengl, Syst. Veg. **3**:560. 1826, excl. syn.; DC. Prodr. **6**:432. 1837; Torr. & Gray, Fl. N. Am. **2**:442. 1843, in part; Torr. in Nicollet's Report, App. B, 153 [237]. 1843; Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886, in part; Macoun, Cat. Canadian Pl. 264. 1884, in part; Millsp. Med. Pl. **1**:91, *pl. 91*. 1892; Goodale, Wild Fls. of Am. 77, *pl. 15*. 1894; Britton & Brown, Ill. Fl. **3**:480, *fig. 4047*. 1898, and ed. 2, 544, *fig. 4625*. 1913, in part; Greenm. in Rhodora **3**:4. 1901; Monogr. Senecio, I. Teil, 23. 1901, and in Engl. Bot. Jahrb. **32**:19. 1902; Britton, Manual 1028. 1901, and ed. 2, 1905; Greenm. in Gray, Manual, ed. 7, 854. 1908; Small & Carter, Fl. Lancaster County 310. 1913.

S. tussilaginoides Walt. Fl. Carol. 208. 1788.

S. rotundifolius Stokes, Bot. Mat. Med. **4**:215. 1812.

S. fastigiatus Schwein. ex Ell. Sketch **2**:331. 1824.

An herbaceous perennial; stems one to several from a relatively slender rootstock, 3 to 6 dm. high, glabrous or not infrequently white-tomentulose in the leaf-axils, along the margins of the petioles, and in the inflorescence; lower leaves petiolate, undivided and rotund-ovate, somewhat triangular-ovate to

oblong-ovate, 1 to 14 cm. long, two-thirds to nearly or quite as broad, crenate to doubly serrate-dentate, usually deeply cordate at the base, green on both surfaces or tinged with purple beneath, glabrous or occasionally slightly tomentulose in the early stages and soon glabrate; petioles 1.5 to 25 cm. long; stem-leaves variable, petiolate to sessile and amplexicaul, lyrate to pinnatisect, reduced towards the inflorescence sometimes to linear entire bracts; inflorescence a terminal several to many-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, calyculate, glabrous or occasionally slightly tomentulose; bracts of the involucre (13–) 21, linear, acute, 6 to 8 mm. long; ray-flowers 8 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: Labrador to Georgia, and west to North Dakota and Arkansas.

Specimens examined.

Labrador: shore of Seal Lake, 3 Aug., 1896, *Spreadborough 14387* (Geol. Surv. Canada Herb.).

Newfoundland: north of Placentia Junction, 11 Aug., 1894, *Robinson & Schrenk* (Gray Herb. and U. S. Nat. Herb.); banks of Salmonier River, 21 Aug., 1894, *Robinson & Schrenk* (Gray Herb., Geol. Surv. Canada Herb., and U. S. Nat. Herb.); Benoist's Cove, Bay of Islands, July, 1895, *Waghorne* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); between Port-aux-Basques and Bay of Islands, July, 1902, collector not indicated (Gray Herb.).

Prince Edward Island: wet meadows, Tignish, 27 July, 1888, *Macoun 14812* (Geol. Surv. Canada Herb.).

Nova Scotia: Arcadia, Yarmouth Co., 29 June, 1911, *Metheny* (Phil. Acad. Nat. Sci. Herb.).

New Brunswick: swamps, Tobique, July, 1884, *Hay 14817* (Geol. Surv. Canada Herb.); along the St. John River, above Woodstock, 3 July, 1899, *Macoun 22537* (Geol. Surv. Canada Herb.).

Quebec: damp thickets, Lake Mistassini, 24 July, 1885, *Macoun 14819* (Geol. Surv. Canada Herb.); Fort Chimo, on the Ungava River, 31 Aug., 1896, *Spreadborough 14386*

(Geol. Surv. Canada Herb.); in swamps and marshes, Anticosti Island, 20 Aug., 1883, *Macoun 14816* (Geol. Surv. Canada Herb.); swamps and sandy woods, River Ste. Anne des Monts, Gaspé, 19 Aug., 1882, *Macoun 14821* (Geol. Surv. Canada Herb.); banks of Grand River, Gaspé Co., 30 June–3 July, 1904, *Fernald* (Gray Herb.); calcareous alpine meadow, Table-top Mountain, Gaspé Co., alt. 1000–1125 m., 7 Aug., 1906, *Fernald & Collins 260* (U. S. Nat. Herb.); coniferous forest, Low's Trail from the Forks of River Ste. Anne des Monts to Table-top Mountain, Gaspé Co., alt. 550 m., *Fernald & Collins 765*, *766*, and *767* (Gray Herb.); mossy arbor-vitae woods, east of Grande Coupe, Percé, Gaspé Co., 6 Aug., 1907, *Fernald & Collins 1208* (Gray Herb.); alluvial woods, mouth of Bonaventure River, Bonaventure Co., 31 July, 1902, *Williams & Fernald* (Gray Herb.); wet alluvial shores, gravelly beaches and flats, between Baldé and the Baie des Chaleurs, Bonaventure River, 5–8 Aug., 1904, *Collins, Fernald & Pease* (Gray Herb.); alluvial thickets, between the Forks and Brûle Brook, Little Cascapedia River, 29 and 30 July, 1904, *Collins, Fernald & Pease* (Gray Herb.).

Ontario: in a bog, Rainy Lake, Algonquin Park, 12 June, 1900, *Macoun 21869* (Geol. Surv. Canada Herb.); river banks, Inglewood, 4 July, 1890, *White 14823* (Geol. Surv. Canada Herb.); swamps and sandy woods, Kammistiquia River, 13 July, 1869, *Macoun 14814* (Geol. Surv. Canada Herb.); Glen Elgin, Lincoln Co., 10 June, 1897, *McCalla 662, 22779* (Geol. Surv. Canada Herb.); swamps above Leamington, 30 May, 1901, *Macoun 26671* (Geol. Surv. Canada Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); London, June, 1884, *Burgess* (U. S. Nat. Herb.); Amherstburg, 9 June, 1882, *Macoun 14813* (Geol. Surv. Canada Herb.).

Maine: wet thickets, Limestone, Aroostook Co., 20 June, 1898, *Fernald 2403* (Gray Herb.); arbor-vitae swamp, Presque Isle, 12 July, 1902, *Williams, Collins & Fernald* (Gray Herb.); cedar swamp and clearings, Blaine, 23 June, 1898, *Fernald 2404* (Gray Herb.).

New Hampshire: Greenville, 6 June, 1897, *Fernald* (Gray Herb.); sphagnum bog, Jaffrey, 10 July, 1897, *Robinson 590* (Gray Herb.).

Vermont: Peacham, 1 July, 1888, *F. Blanchard* (Mo. Bot. Gard. Herb.); Brandon, 8 June, 1883, *Knowlton* (U. S. Nat. Herb.); Castleton, 3 June, 1898, *Eggleston* (Mo. Bot. Gard. Herb.); Windham, 25 July, 1901, *W. H. Blanchard* (Gray Herb.); Manchester, 27 June, 1898, *Day 102* (Gray Herb. and U. S. Nat. Herb.).

Massachusetts: Hamilton, Essex Co., *Oakes* (Gray Herb.); near Boston, 13 June, 1854, *ex Herb. Wm. Boot* (Gray Herb.); without definite locality, *Pickering* (Phil. Acad. Nat. Sci. Herb.); Boston, *ex Herb. Short* (Phil. Acad. Nat. Sci. Herb.); Arlington Heights, 5 June, 1904, *Greenman 3005* (Mo. Bot. Gard. Herb.); Concord, 30 May, 1896, *Greenman 305* (Mo. Bot. Gard. Herb.); Purgatory Swamp, Dedham, 30 May, 1897, *Greenman 280* (Mo. Bot. Gard. Herb.); Holbrook, 18 June, 1899, *Greenman 609* (Mo. Bot. Gard. Herb.); South Framingham, 18 May, 1890, *Sturtevant* (Mo. Bot. Gard. Herb.); Nonquitt, 21–30 May, 1889, *Sturtevant* (Mo. Bot. Gard. Herb.); Southampton, *ex Herb. Chapman* (Mo. Bot. Gard. Herb.).

Rhode Island: Monns Swamp, Providence, 24 May, 1891, *Collins* (Gray Herb.); Providence, coll. of 1846, *Thurber* (Gray Herb.), 10 June, 1900, *Chamberlain 154* (U. S. Nat. Herb.), and without date, *Olney* (Kew Herb.).

Connecticut: Southington, 30 May, 1896, *Andrews 4* (Gray Herb.), 25 May, 1897, *Bissell 112, 1480* (Mo. Bot. Gard. Herb.); Waterbury, 3 June, 1888, *Du Bois* (U. S. Nat. Herb.); New Haven, without date, *Eaton* (Gray Herb.); near Maltby Park, New Haven, 28 May, 1884, *Safford 85* (U. S. Nat. Herb.); Bridgeport, 25 May, 1896, *Eames* (U. S. Nat. Herb.).

New York: Lebanon Springs, 31 May, 1898, *Harrison 8* (U. S. Nat. Herb.); vicinity of North Harpersfield, Delaware Co., June, 1906, *Topping 69, 103, 106* (U. S. Nat. Herb.); vicinity of Oneida, June–July, 1914, *Maxon* (U. S. Nat. Herb.); near Syracuse, *Straub* (U. S. Nat. Herb.); Ithaca, 3 and 21 June, 1885, *Coville*, 21 June, 1889, *Pearce*, and 31

May, 1890, *Rowlee* (U. S. Nat. Herb.); near Ithaca, coll. of 1889, *Norris* (Mo. Bot. Gard. Herb.); Cascadilla Creek, 6 June, 1877, *Trelease* (Mo. Bot. Gard. Herb.); Fall Creek, 14 June, 1893, *Schrenk* (Mo. Bot. Gard. Herb.); western New York, collector and date not indicated (Gray Herb.); Clove Lake, Staten Island, 28 May, 1905, *Dowell 3764* (Mo. Bot. Gard. Herb.).

New Jersey: New Durham, *Browne* (Kew Herb.); Tenafly, 26 May, 1894, *Pollard* (U. S. Nat. Herb.); Fairview, 23 May, 1895, *Van Sickle* (U. S. Nat. Herb.); Charlotteburg, 24 May, 1908, *Mackenzie 3085* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Newfoundland, 14 June, 1908, *Mackenzie 3127* (U. S. Nat. Herb.); Mt. Tabor, 16 June, 1907, *Mackenzie 2640* (Mo. Bot. Gard. Herb.); Budd's Lake, 28 May, 1895, *Heritage* (Phil. Acad. Nat. Sci. Herb.); Bound Brook, 31 May, 1904, *House* (U. S. Nat. Herb.); river bank above Crosswick's Creek, 29 May, 1904, *Williamson* (C. S. Williamson Herb.); Batsto, 22 May, 1912, *Bassett 17* (Phil. Acad. Nat. Sci. Herb.); shore of Delaware River, Camden Co., 10 May, 1910, *Long 3259* (Phil. Acad. Nat. Sci. Herb.); Washington Park, 9 May, 1897, *Jahn* (Phil. Acad. Nat. Sci. Herb.); below Washington Park, 15 May, 1895, *Jahn* (Phil. Acad. Nat. Sci. Herb.); Glassboro, 14 May, 1910, *Long 3346* (Phil. Acad. Nat. Sci. Herb.); Bennett, 29 Oct., 1912, *Long 7954* (Phil. Acad. Nat. Sci. Herb.); without locality or date, *Read* (Phil. Acad. Nat. Sci. Herb.).

Pennsylvania: Milford, May, 1905, *Mell* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Tobyhanna Mills, 3 July, 1893, *Crawford* (Phil. Acad. Nat. Sci. Herb.); in deep shaded bog, Tobyhanna, 27 July, 1907, *Bartram* (Phil. Acad. Nat. Sci. Herb.); bog near Easton, 18 May, 1894, *Tyler* (Phil. Acad. Nat. Sci. Herb.); Hellertown, *ex Herb. Detwillert* (Phil. Acad. Nat. Sci. Herb.); streamlet east of Slatington reservoir, 2 June, 1912, *Pretz 4512* (Phil. Acad. Nat. Sci. Herb.); Threemile Run, 21 May, 1886, *Fretz* (Phil. Acad. Nat. Sci. Herb.); Rock Hill, 2 June, 1889, *Pollard* (U. S. Nat. Herb.); Sellersville, June, 1887, *Fretz* (Phil. Acad. Nat. Sci. Herb.); Doyles-

town, 18 May, 1883, *Pond* (U. S. Nat. Herb.); Woodbourne, 30 May, 1904, *Brown* (Phil. Acad. Nat. Sci. Herb.); Tullytown, 30 May, 1899, *Williamson* (C. S. Williamson Herb.); Tullytown, 3 May, 1899, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Tullytown, 20 May, 1899, *Fretz* (Phil. Acad. Nat. Sci. Herb.); Bucks Co., coll. of 1867, *Allen* (Phil. Acad. Nat. Sci. Herb.); Shannonville, 12 June, 1891, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Arcola, 6 May, 1892, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Merion, 25 April, 1871, *Redfield* (Mo. Bot. Gard. Herb.); French Creek Falls, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); Darby Creek, near Paoli, 21 May, 1905, *Bartram* (Phil. Acad. Nat. Sci. Herb.); Westtown Meadow, 7 May, 1890, *N. H. C.* (Phil. Acad. Nat. Sci. Herb.); near Pocopson, 27 May, 1904, *Painter 628* (Mo. Bot. Gard. Herb.); near Brandywine, *Townsend* (Phil. Acad. Nat. Sci. Herb.); New Garden, 29 May, 1904, *Vanatta* (Phil. Acad. Nat. Sci. Herb.); Haverford, *D. B. Smith* (Kew Herb.); west side of Wissahickon River, 18 June, 1834, collector not indicated (Phil. Acad. Nat. Sci. Herb.); West Philadelphia, 4 May, 1890, *MacElwee 475* (Phil. Acad. Nat. Sci. Herb.); Crum Creek, near Philadelphia, 6 June, 1867, *Redfield* (Mo. Bot. Gard. Herb.); Crum Creek, 30 May, 1898, *Githens* (Phil. Acad. Nat. Sci. Herb.); Byberry, coll. of 1862, *Martindale* (Phil. Acad. Nat. Sci. Herb.); near Mickelton, 14 May, 1892, *Heritage* (Phil. Acad. Nat. Sci. Herb.); Delaware Co., 10 May, 1891, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); Clifton, 7 May, 1893, *Lloyd* (Phil. Acad. Nat. Sci. Herb.); Dillerville swamp, Lancaster Co., 30 May, 1901, *Heller* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); on Little Conestoga near Stoneroad's Mill, 23 May, 1901, *Heller* (Gray Herb. and U. S. Nat. Herb.); between York Furnace and Tucquam, 11 May, 1901, *Heller* (Gray Herb. and U. S. Nat. Herb.); Fishing Creek, 16 May, 1906, *Carter* (Phil. Acad. Nat. Sci. Herb.); west branch of Octoraro Creek, 6 May, 1891, *Small & Heller* (U. S. Nat. Herb.); York Furnace, York Co., 13 May, 1899, *MacElwee 201* (Phil. Acad. Nat. Sci. Herb.); Meadow-ground Mountain, Fulton Co., 4 June, 1905, *Stone 226* (Phil. Acad.

Nat. Sci. Herb.); Mt. Alto, coll. of 1900, *Illick* (Mo. Bot. Gard. Herb.).

Delaware: Granogue, 27 May, 1896, *Commons* (Phil. Acad. Nat. Sci. Herb.); near Centerville, 26 May, 1875, *Commons* (Phil. Acad. Nat. Sci. Herb.); Green Bank, 12 May, 1884, *Commons* (Phil. Acad. Nat. Sci. Herb.); Elsmere, 14 May, 1894, *Commons* (Phil. Acad. Nat. Sci. Herb.); west branch of Naaman's Creek, 15 May, 1909, *Pennell 2040* (Phil. Acad. Nat. Sci. Herb.).

Maryland: along the Susquehanna River, Cecil Co., 18 April, 1913, *St. John & Long 8076* (Phil. Acad. Nat. Sci. Herb.); Calreston, 5 May, 1889, *Thurston* (U. S. Nat. Herb.); near Great Falls, Montgomery Co., 18 May, 1900, *M. F. Miller* (U. S. Nat. Herb.); Plummer's Island, near Cabin John, 30 April, 1902, *Kearney & Maxon* (U. S. Nat. Herb.); Montgomery Co., near Washington, *Batchelder* (Phil. Acad. Nat. Sci. Herb.); Marlboro, 6 May, 1900, *Morris 914* (U. S. Nat. Herb.); Savage River, Garrett Co., 25 April, 1897, *Knowlton* (U. S. Nat. Herb.).

District of Columbia: Washington, coll. of 1873, *Vasey* (U. S. Nat. Herb.); High Island, 2 April, 1876, *Ward* (U. S. Nat. Herb.); vicinity of Washington, 10 June, 1877, *Ward* (U. S. Nat. Herb.); without definite locality, 29 April, 1888, *Burgess* (U. S. Nat. Herb.); National Park, 6 May, 1892, *F. Blanchard* (Mo. Bot. Gard. Herb.); Glen Echo, 24 April, 1895, *Pollard 89* (U. S. Nat. Herb.); Rock Creek Park, 4 May, 1896, *Steele* (Gray Herb. and U. S. Nat. Herb.); High Island, April, 1898, *Williamson* (C. S. Williamson Herb.); pine woods, Dalecartia Reservoir, 23 May, 1905, *Painter 1305* (Mo. Bot. Gard. Herb.); Chevy Chase, 16 May, 1905, *House 728* (Mo. Bot. Gard. Herb.).

Virginia: Arlington, April, 1891, *F. Blanchard* (Mo. Bot. Gard. Herb.); Stony Man Mountain, 3 July, 1903, *G. S. Miller* (U. S. Nat. Herb.); on Bear Creek, east of Hungry Hollow, Smyth Co., alt. 830 m., 7 June, 1892, *Small* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); about Chatham Hill Gap, Walker Mountain, alt. 915 m., *Small* (Gray Herb.); Walker Mountain,

alt. 640 m., *E. G. Britton & A. M. Vail* (Phil. Acad. Nat. Sci. Herb.).

North Carolina: Cloudland, Roan Mountain, 25 June, 1902, *Cannon 10* (U. S. Nat. Herb.); vicinity of Asheville, May, 1888, *McCarthy* (U. S. Nat. Herb.); Biltmore, 24 April, 1896, and 13 April, 1897, *Biltmore Herb. 889, 889a* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); mountains of North Carolina, *Ashe* (U. S. Nat. Herb.).

Georgia: without locality, *ex Herb. Chapman 2340* (Mo. Bot. Gard. Herb.).

West Virginia: Upshur Co., 4 May, 1895, and 27 May, 1897, *Pollock* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

Ohio: Berea, May, 1895, *Ashcroft* (Mo. Bot. Gard. Herb.); Canton, May, 1835, *Riehl* (Mo. Bot. Gard. Herb.); Columbus, *Sullivant* (Kew Herb.); Champaign Co., 27 May, 1893, *Werner 138* (Gray Herb.).

Michigan: Port Huron, 18 May, 1896, *Dodge 296* (U. S. Nat. Herb.); moist rich woods and river banks, Rochester, May, 1914, *Farwell 3384, 3628½*, and at Parkdale Farms, colls. of May and June, 1912, 1913, *Farwell 2552, 3408, 3425* (Mo. Bot. Gard. Herb.); Owosso, 21 May, 1889, *Hicks* (U. S. Nat. Herb.).

Indiana: Chain Lakes, 6 May, 1913, *Nieuwland 11005* (Mo. Bot. Gard. Herb.); Mineral Springs, 20 May, 1912, *Nieuwland 10019* (Mo. Bot. Gard. Herb.); bank of Wabash River, west of Shively Bridge, 19 May, 1901, *Mackenzie* (U. S. Nat. Herb.); West Lafayette, 10 May, 1912, *Overholts* (Mo. Bot. Gard. Herb.); Jefferson Co., *Hubbard* (Gray Herb.); banks of Lick Creek near Abby Dell, 25 May, 1901, *Mackenzie* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

Kentucky: Blue-licks and Mud-lick, *Short* (Phil. Acad. Nat. Sci. Herb.); Bowling Green, May, 1892, *Price* (Mo. Bot. Gard. Herb.).

Illinois: in moist rich thickets and wet meadows near Beach, 16 June, 1907, *Greenman 2007, 2022, 2023* (Mo. Bot. Gard. Herb.); near Woodlawn, Jefferson Co., 16 May, 1898, *Eggert* (Mo. Bot. Gard. Herb.).

Minnesota: Bear Creek, May, 1890, *Holzinger* (U. S. Nat. Herb.).

South Dakota: Brookings, coll. of 1892, *Williams* (U. S. Nat. Herb.); along creeks, Brookings, 26 May, 1894, *Thornber* (Mo. Bot. Gard. Herb.); low ground, Oakwood, 23 May, 1902, *A. G. J.* (Mo. Bot. Gard. Herb.); Custer Co., alt. 1675 m., 16 July, 1892, *Rydberg 827* (Gray Herb.), in part.

Nebraska: Emerson, 12 June, 1893, *Clements 2513* (U. S. Nat. Herb.).

Iowa: Iowa City, *Hitchcock* (Mo. Bot. Gard. Herb.); prairies, near Council Bluffs, Nicollet's North-Western Expedition, 16 May, 1839, *Geyer 97* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.).

Missouri: low ground, Adair Co., 5 May, 1884, *Sheldon* (Mo. Bot. Gard. Herb.); Courtney, coll. of 1880, *Bush* (U. S. Nat. Herb.); banks of River des Peres, near St. Louis, May, 1883, *Engelmann* (Mo. Bot. Gard. Herb.); "Valley Forge", 11 May, 1888, *Pammel* (Mo. Bot. Gard. Herb.); Glencoe, 22 May, 1879, *Eggert* (Mo. Bot. Gard. Herb.); Allenton, April, 1890, *Letterman* (Mo. Bot. Gard. Herb.); Allenton, 23 May, 1892, *Glatfelter 293* (Mo. Bot. Gard. Herb.); Cliff Cave, 26 Aug., 1898, *Norton* (Mo. Bot. Gard. Herb.); Pacific, 4 July, 1879, *Eggert* (Mo. Bot. Gard. Herb.); Pacific, 15 May, 1900, *Norton* (Mo. Bot. Gard. Herb.); Victoria, 10 May, 1890, *Hitchcock* (Mo. Bot. Gard. Herb.); near Sunnyside, 22 May, 1879, *Eggert* (Mo. Bot. Gard. Herb.); De Soto, 22 May, 1892, *Eggert* (Mo. Bot. Gard. Herb.); Valles Mines, May, 1835, *(?)Engelmann* (Mo. Bot. Gard. Herb.); Shannon Co., coll. of 1890, *Bush* (U. S. Nat. Herb.); Monteer, 24 May, 1900, *Bush 370* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); along streams, Monteer, 14 May, 1901, and 29 April, 1907, *Bush 465, 4395* (Mo. Bot. Gard. Herb.); Greene Co., 30 May, 1879, *Shepard* (Gray Herb.); Swan, Taney Co., 21 April, 1907, *Bush 4225* (Mo. Bot. Gard. Herb.); Galena, Stone Co., 3 May, 1914, *E. J. Palmer 5743* (Mo. Bot. Gard. Herb.); Reding's Mill, 9 April, 1909, *E. J. Palmer 1655* (Mo. Bot. Gard. Herb.).

Arkansas: Eureka Springs, Carroll Co., 15 May, 1914, *E. J. Palmer 5623* (Mo. Bot. Gard. Herb.); northwestern Arkansas, April, 1880, *Harvey 45* (Gray Herb.).

Var. **gracilis** (Pursh) Britt. in Britton & Brown, Ill. Fl. **3**:481. 1898; Britton, Manual 1028. 1901, and ed. 2, 1905; Greenm. Monogr. Senecio, I. Teil, 23. 1901, in Engl. Bot. Jahrb. **32**:19. 1902, and in Gray, Manual, ed. 7, 854. 1908; Porter, Fl. Penn. 339. 1903.

S. gracilis Pursh, Fl. Am. Sept. **2**:529. 1814, and ed. 2, 1816; DC. Prodr. **6**:432. 1837; Small, Fl. Southeastern U. S. 1303. 1903, and ed. 2, 1913.

Stems slender; basal leaves relatively small, those of the offshoots, as well as the lower stem-leaves, rotund-ovate to oblong-ovate, 1 to 2 cm. long and nearly to quite as broad. In all other essential characters like the species into which it directly passes.

Distribution: occurring with the species, but especially in moist open places.

Specimens examined:

Ontario: Squirrel Island, 10 June, 1904, *Dodge 14, 297*[a] (U. S. Nat. Herb.).

New Jersey: Point Pleasant, *Williamson* (C. S. Williamson Herb.); meadows, etc., New Egypt, 14 May, 1906, *Grove 315* (Phil. Acad. Nat. Sci. Herb.); Spray, *de Chalmot* (U. S. Nat. Herb.); Swedesboro, 15 May, 1892, *Lippincott* (Phil. Acad. Nat. Sci. Herb.).

Pennsylvania: Wayne, 2 May, 1908, *Bartram* (Phil. Acad. Nat. Sci. Herb.); Lehigh Co., *Pretz 345, 4398, 3272, 6483, 6457* (Phil. Acad. Nat. Sci. Herb.); Bucks Co., coll. of 1860, *Krout* (Phil. Acad. Nat. Sci. Herb.); Nockamixon, coll. of 1893, *Crawford* (Phil. Acad. Nat. Sci. Herb.); near Quakertown, 9 May, 1899, *Fretz* (Phil. Acad. Nat. Sci. Herb.); Rock Hill, 31 May, 1903, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); Tohickon Creek near Doylestown, 30 May, 1902, *Brown* (Phil. Acad. Nat. Sci. Herb.); meadows along Wissahickon Creek, Fort Washington, 7 May, 1909, *Long* (Phil. Acad. Nat. Sci. Herb.); near Ardmore, 15 May, 1909, *Eckfeldt* (Phil. Acad. Nat. Sci. Herb.); near Tredyffrin, 6 May, 1906, *Bartram* (Phil. Acad. Nat. Sci. Herb.); Chester Heights, 9 May, 1909, *Pennell 2030* (Phil. Acad. Nat. Sci. Herb.); Dillerville Swamp,

Lancaster Co., 25 May, 1889, *Heller* (Gray Herb.); New Providence, 18 May, 1900, *Heller* (Mo. Bot. Gard. Herb.); about Penryn, Lebanon Co., 27 May, 1893, *Heller & Halbeck 876* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

Delaware: west branch of Naaman's Creek, 15 May, 1909, *Pennell 2044* (Phil. Acad. Nat. Sci. Herb.); near Cooch's Mill, 29 May, 1896, *Commons* (Phil. Acad. Nat. Sci. Herb.).

Maryland: near Great Falls, 8 May, 1895, *Mearns* (U. S. Nat. Herb.).

District of Columbia: Carberry Meadows, 7 May, 1903, *Steele* (Mo. Bot. Gard. Herb.).

Michigan: marl beds on Parkdale Farm, 25 May, 1913, *Farwell 3415* (Mo. Bot. Gard. Herb.); in wet meadows, Grand Rapids, 17 May, 1894, and 26 June, 1897, *Cole* (Gray Herb.).

Illinois: Palos Park, 22 May, 1913, *Millspaugh 3744* (Field Mus. Herb.).

Minnesota: Fort Snelling, coll. of 1888, *Forwood,* also 1 and 14 June, 1891, *Mearns* (U. S. Nat. Herb.); Nicollet, June, 1892, *Ballard* (U. S. Nat. Herb.).

North Dakota: in bogs, Butte, 3 June, 1906, *Lunell* (U. S. Nat. Herb.).

Var. **semicordatus** (Mack. & Bush) Greenm. comb. nov.

S. semicordatus Mack. & Bush, Mo. Bot. Gard. Ann. Rept. **16**:107. 1905.

S. aureus Mack. & Bush, Manual Fl. Jackson County, Mo. 207. 1902, in part, not L.

S. aureus> × *Balsamitae* Greenm. Rhodora **10**:69. 1908.

Lower leaves rotund-ovate to oblong-ovate, 1 to 8 cm. long, 1 to 4 cm. broad, usually rounded at the apex, shallowly cordate.

Distribution: beaches, shores, and prairies. Eastern Quebec, Illinois, and Missouri.

Specimens examined:

Quebec: wet alluvial shores, gravelly beaches and flats, between Baldé and the Baie des Chaleurs, Bonaventure River, 5, 6, and 8 Aug., 1904, *Collins, Fernald & Pease* (Gray Herb., photograph in Field Mus. Herb. and Mo. Bot. Gard. Herb.).

Illinois: in wet meadows near Beach, Lake Co., 16 June, 1907, *Greenman 2022* (Field Mus. Herb., photograph in Mo. Bot. Gard Herb.), in part; low ground, Evanston, *Earl,* also *Price* (U. S. Nat. Herb.).

Missouri: on prairies, Levasy, Jackson Co., 18 May, 1902, *Bush 1678* (Gray Herb. and Mo. Bot. Gard. Herb.), TYPE; swales on prairies, Levasy, 11 May, 1904, *Bush 1940* (Mo. Bot. Gard. Herb.).

Although some of the specimens cited show indications of a possible origin by hybridization, as was indicated in 'Rhodora' in 1908, yet the examination of additional material points rather towards an origin by variation.

54. **S. Robbinsii** Oakes ex Rusby, in Bull. Torr. Bot. Club **20**:19, *pl. 139*. 1893; Heller, Cat. N. Am. Pl. 147. 1898, and ed. 2, 230. 1900; Britton & Brown, Ill. Fl. **3**:480, *fig. 4046*. 1898, and ed. 2, 544, *fig. 4624*. 1913; Greenm. in Rhodora **3**:4. 1901; Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Small, Fl. Southeastern U. S. 1303. 1903, and ed. 2, 1913; Kennedy in Rhodora **6**:133. 1904; Britton, Manual 1028. 1901, and ed. 2, 1905; Greenm. in Gray, Manual, ed. 7, 854. 1908.

S. aureus var. *lanceolatus* Oakes ex Torr. & Gray, Fl. N. Am. **2**:442. 1843; Macoun, Cat. Canadian Pl. 265. 1884.

S. aureus var. *Balsamitae* Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886, in part, as to *S. aureus* var. *lanceolatus* Oakes in synonymy.

An herbaceous perennial, glabrous or slightly tomentose along the margins of the petioles of the leaves, especially near their sheathing base; lower leaves long-petiolate, ovate-rotund to oblong-lanceolate, 1 to 10 cm. long, 1 to 3 cm. broad, crenate to sharply and more or less serrate-dentate, cordate to abruptly narrowed at the base, green and glabrous on both surfaces; upper stem-leaves petiolate and sublyrate or sessile and more or less pinnatisect; inflorescence a terminal several to many-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, calyculate; bracts of the involucre about 21, linear, acute, glabrous; ray-flowers 10 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: Nova Scotia and Quebec, south to northern New England and New York; also on Roan Mt., North Carolina.

Specimens examined:

Nova Scotia: Margaree, Big Intervale, Cape Breton Island, 19 July, 1898, *Macoun 19717* (Geol. Surv. Canada Herb.); Baddeck, Cape Breton Island, 10 July, 1898, *Macoun 19718* (Geol. Surv. Canada Herb.); Boylston, July, 1890, *Hamilton 22333* (Geol. Surv. Canada Herb.); in swamps and ditches, Truemanville, 30 July, 1883, *Trueman 14773* (Geol. Surv. Canada Herb.); railroad ditch, Truro, 27 July, 1911, *Bartram* (Phil. Acad. Nat. Sci. Herb.).

Prince Edward Island: rocky places, Winslow Road, 16 July, 1888, *Macoun 14794* (Geol. Surv. Canada Herb.).

Quebec: swamp near Georgeville, Lake Memphremagog, 12 July, 1902, *Churchill* (Gray Herb.).

Maine: dry thicket, Van Buren, 24 July, 1893, *Fernald* (Gray Herb.); open swampy woods, Aroostook Co., *Mackenzie 3633* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); damp thickets, Cutler, 5 June, 1902, *Kennedy, Williams, Collins & Fernald* (Gray Herb.); wet meadow, Fitzgerald Pond, near Moosehead Lake, 6 July, 1895, *Fernald 272* (Gray Herb., U. S. Nat. Herb., Greene Herb., and Mo. Bot. Gard. Herb.); meadow near High Head, Mt. Desert, 1 July, 1891, *Redfield* (Phil. Acad. Nat. Sci. Herb. and Mo. Bot. Gard. Herb.); Winthrop, coll. of 1862, *Sturtevant* (Mo. Bot. Gard. Herb.); Hartford, June, 1885, and July, 1892, *Parlin* (Gray Herb.); Westbrook, July, 1900, *Ricker 672* (U. S. Nat. Herb.).

New Hampshire: new gate of Notch, White Mountains, 7 July, 1878, *E. & C. E. Faxon* (Gray Herb.); Crawford Notch, 1 July, 1898, *Greenman 1105* (Gray Herb. and Mo. Bot. Gard. Herb.); wet meadow, Glen House, 10 July, 1910, *Williamson 1421* (C. S. Williamson Herb.); Jackson, 26 July, 1890, *Churchill* (U. S. Nat. Herb.); Jackson, 10 Sept., 1896, *Purdie* (Gray Herb.); Llandoff Valley Meadows, Franconia, 18 June, 1895, *E. & C. E. Faxon* (Gray Herb. and U. S. Nat. Herb.); cedar swamp, Franconia, 19 June, 1895, *E. & C. E. Faxon* (Gray Herb.).

Vermont: cedar swamp, Willoughby Lake, 26 July, 1885, *Deane* (Gray Herb.); Willoughby Mountain, 15 July, 1906, *Williamson* (C. S. Williamson Herb.); Stowe, July, 1899, *Churchill & Greenman 294* (Mo. Bot. Gard. Herb.); Peacham, July, 1892, *F. Blanchard* (Mo. Bot. Gard. Herb.); Starksboro, 10 June, 1898, *Eggleston* (Mo. Bot. Gard. Herb.); Middlebury, 23 and 25 June, 1883, *Brainerd* (Gray Herb); Pittsford, 14 June, 1902, *Eggleston 2783* (Phil. Acad. Nat. Sci. Herb.); on cold bog, Rutland, 21 June, 1899, *Eggleston 1383* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Mendon, 2 July, 1900, *Eggleston 2040* (Mo. Bot. Gard. Herb.); Windham, coll. of 1901, *W. H. Blanchard* (Gray Herb.).

New York: Stony Creek Ponds, Adirondack Mountains, 29 June, 1899, *Rowlee, Wiegand & Hastings* (Gray Herb.); north woods, Herkimer Co., coll. of 1864, *Paine* (Gray Herb.); meadow, South Branch, Herkimer Co., Aug., 1879, *Tweedy* (U. S. Nat. Herb.), form with somewhat less elongated leaves.

North Carolina: summit of Roan Mountain, Mitchell Co., alt. 1920 m., *Small & Heller 234* (Mo. Bot. Gard. Herb.).

55. S. pseudaureus Rydb. Bull. Torr. Bot. Club **24**:298. 1897; *ibid.* **27**: 180, *pl. 5, fig. 10.* 1900; Mem. N. Y. Bot. Gard. **1**:446. 1900; Fl. Colo. 397. 1906; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Piper, Contr. U. S. Nat. Herb. **11**:598. 1906; Nels. in Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909, in part; Daniels, Univ. Mo. Studies, Sci. Ser. **2**:252. 1911; Wooton & Standley, Contr. U. S. Nat. Herb. **19**:747. 1915.

An herbaceous perennial; stems erect, 3 to 7 dm. high, white-tomentulose in the axils of the leaves, along the margins of the petioles towards their base, and in the inflorescence, otherwise glabrous or nearly so; lower leaves long-petiolate, ovate-rotund to oblong-ovate, 1 to 10 cm. long, 1 to 6 cm. broad, rounded to acute at the apex, shallowly cordate, crenate to doubly serrate with somewhat incurved teeth; petioles 1 to 23 cm. long; stem-leaves petiolate or sessile, undivided or sublyrate to pinnatisect, and usually with rather sharply and doubly serrate-dentate and frequently revolute margins, more

or less attenuate; inflorescence a terminal few to many-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, calyculate; bracts of the involucre (13–) 21, linear, acute, 6 to 8 mm. long, glabrous except at the penicillate tip; ray-flowers 10 to 13, rays pale yellow; disk-flowers numerous; achenes glabrous.

Distribution: Saskatchewan, Alberta and British Columbia, south to New Mexico and California.

Specimens examined:

Saskatchewan: District of Assiniboia, 1 Aug., 1901, *Williamson* (C. S. Williamson Herb.).

Alberta: Laggan, Rocky Mountain Park, 13 July, 1904, *Macoun 65016* (Gray Herb. and Geol. Surv. Canada Herb.); trail to Burgess Pass, Yoho Valley, 28 Aug., 1904, *Macoun 65017* (Gray Herb. and Geol. Surv. Canada Herb.); Lake Louise, alt. 1830–2135 m., 17 July, 1906, *Brown 559* (Phil. Acad. Nat. Sci. Herb.); near Banff, 6 July, 1891, *Macoun* (U. S. Nat. Herb. 232000); Banff, alt. 1340 m., 7 July, 1907, *Butters & Holway 66* (U. S. Nat. Herb.); in swampy places, summit of South Kootenai Pass, 9 Aug., 1881, *Dawson 14768* (Geol. Surv. Canada Herb.); in wet places, North Kootenai Pass, 28 July, 1883, *Dawson 14815* (Geol. Surv. Canada Herb.).

British Columbia: Burgess Trail, vicinity of Field, alt. 1545–1830 m., 29 June and 16 July, 1906, *Brown 518* (Phil. Acad. Nat. Sci. Herb.); in woods, Emerald Lake, alt. 1310 m., 4 Aug., 1904, *Petersen 148* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Bonaparte River, 18 June, 1889, *Macoun* (U. S. Nat. Herb. 219791), in part; Mount St. Thomas, between Kettle and Columbia Rivers, 8 Aug., 1902, *Macoun 64994* (Gray Herb. and Geol. Surv. Canada Herb.); grassy thickets, Guichon Creek, 8 July, 1888, *Dawson 14769* (Geol. Surv. Canada Herb.); damp places, between North Thompson and Bonaparte Rivers, alt. 1220 m., 18 June, 1889, *Macoun 14770* (Geol. Surv. Canada Herb.), in part; Trail, 9 June, 1902, *Macoun 64993* (Geol. Surv. Canada Herb.).

Montana: Midvale, 1 July, 1903, *Umbach 238* (U. S. Nat. Herb.); Big Fork, Flathead Co., 14 June, 1904, *Jones* (U. S. Nat. Herb.); Big Fork, 15 July, 1908, and Swan Lake, 25 Aug., 1908, *Clemens* (Field Mus. Herb. 376698 and 384938); MacDougal Peak, 31 July, 1908, *Clemens* (Mo. Bot. Gard. Herb.); Little Belt Pass, 10 Aug., 1896, *Flodman 918* (Mo. Bot. Gard. Herb.), CO-TYPE; Spanish Basin, Gallatin Co., alt. 1980 m., 28 June, 1897, *Rydberg & Bessey 5263* (Gray Herb., Berlin Herb., and N. Y. Bot. Gard. Herb.); Gallatin Basin, alt. 2130 m., 5 Aug., 1905, *Blankenship 291* (U. S. Nat. Herb., Mo. Bot. Gard. Herb., and Phil. Acad. Nat. Sci. Herb.).

Yellowstone National Park: Lone Star Geyser Basin, 7 Aug., 1897, *Rydberg & Bessey 5262* (U. S. Nat. Herb. and N. Y. Bot. Gard. Herb.); Gibbon Cañon, 28 Aug., 1899, *A. & E. Nelson 6748* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Yellowstone Falls, 5 Aug., 1885, *Letterman 77* (Mo. Bot. Gard. Herb.); without definite locality, 5 Aug., 1902, *Mearns 2860, 2978* (U. S. Nat. Herb.); Amethyst Creek, 14 Aug., 1887, *Knowlton* (U. S. Nat. Herb. 201412).

Colorado: open wet meadow, below Estes Park, 5 July, 1912, *Churchill* (J. R. Churchill Herb.); Wagon Wheel Gap, Mineral Co., July, 1882, *B. H. Smith* (Phil. Acad. Nat. Sci. Herb.); Mancos, 21 June, 1898, *Baker, Earle & Tracy 45* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

New Mexico: vicinity of Chama, Rio Arriba Co., alt. 715–870 m., 9 July, 1911, *Standley 6635* (U. S. Nat. Herb.); along the Pecos River, east of Glorieta, San Miguel Co., alt. 1980 m., *A. & E. Heller 3682* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

Idaho: West Fork of Priest River, alt. 900 m., 4 Aug., 1897, *Leiberg 2825* (U. S. Nat. Herb.); near Santianne Divide, west side, alt. 850 m., 23 June, 1895, *Leiberg 1020* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Granite Station, Kootenai Co., 30 July, 1892, *Sandberg, MacDougal & Heller 803* (U. S. Nat. Herb.); near Lewiston, 17 June, 1894, *Henderson* (U. S. Nat. Herb.); Fork of Wood River, alt. 1830 m., 25 July, 1895, *Henderson 3235* (U. S. Nat. Herb.); Twilight Gulch, Owyhee Co.,

alt. 1675 m., 23 June, 1911, *Macbride 973* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); House Creek, Owyhee Co., 29 June, 1912, *Nelson & Macbride 1808* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

Utah: Ogden, June, 1871, *Coulter* (U. S. Nat. Herb.).

Nevada: grassy lowlands, Bieroth's Ranch, McDonald Creek, 2 Aug., 1912, *Nelson & Macbride 2159* (U. S. Nat. Herb.); East Humboldt Mountains, alt. 1985 m., U. S. Geol. Exploration of the 40th Parallel, *Watson 667* (Gray Herb. and U. S. Nat. Herb.).

Washington: eastern Washington, 26 July, 1892, *Henderson* (Mo. Bot. Gard. Herb.); Ellensburg, 2 June, 1897, *Whited 442* (U. S. Nat. Herb.); along streams, Mount Paddo (Adams), 30 June, 1885, *Suksdorf* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Falcon Valley, July, 1885, *Suksdorf 571* (Gray Herb.); without definite locality, coll. of 1883, *Brandegee* (Gray Herb.), and coll. of 1889, *Vasey 537* (U. S. Nat. Herb.).

Oregon: Crow Creek, Wallowa Co., alt. 1295 m., 3 July, 1897, *Sheldon 8512* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); on Miller Trail, near Sled Springs, Imnaha National Forest, alt. 1265 m., 12 July, 1907, *Jardine 89* (U. S. Nat. Herb.); Union Co., coll. of 1879, *Cusick 755* (Gray Herb.); Minum River, 16 Aug., 1897, *Sheldon 8710* (U. S. Nat. Herb.); Big Meadows, Des Chutes River, Crook Co., alt. 1370 m., 23 July, 1894, *Leiberg 515* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Crater Lake, 10 Aug., 1897, *Austin 1610* (U. S. Nat. Herb.); Cascade Mountains, Oregon Boundary Commission, coll. of 1860, *Lyall* (Gray Herb.); Brown's Meadow on Rogue River, alt. 1300 m., 8 July, 1889, *Leiberg 4287* (U. S. Nat. Herb.); without definite locality, U. S. Exploring Expedition, *Wilkes 494* (U. S. Nat. Herb. 48748).

California: Goose Lake Valley, July, 1895, *Austin 558* (U. S. Nat. Herb. 666887); Davis Creek, Modoc Co., Aug., 1894, *Austin* (Phil. Acad. Nat. Sci. Herb.); Upper Funston Meadows, basin of the Upper Kern River, Tulare Co., alt. 1980 m., July, 1904, *Hall & Babcock 5569* (Gray Herb.).

Var. **flavulus** (Greene) Greenm. comb. nov.

S. flavulus Greene, Pittonia **4**:108. 1900; Rydb. Bull. Torr. Bot. Club **27**:185. 1900; Fl. Colo. 397. 1906, in part.

S. Balsamitae Nels. in Coulter & Nelson, Manual Cent. Rocky Mountains 583. 1909, in part, not Muhl.

Stems slender, 1.5 to 4 dm. high; leaves relatively small, the radical and lower stem-leaves ovate-rotund to ovate-oblong, .8 to 4 cm. long, 8 to 20 mm. broad, rounded to acute at the apex, crenate to serrate-dentate, more or less cordate at the base; petioles 1 to 8.5 cm. long; upper stem-leaves petiolate and sublyrate or sessile and laciniate to entire.

Distribution: southern Wyoming and Colorado.

Specimens examined:

Wyoming: river bottoms, Encampment, Carbon Co., alt. 2175 m., 15 June, 1901, *Tweedy 4132* (U. S. Nat. Herb.).

Colorado: Walden, Larimer Co., 8 July, 1903, *Goodding 1494* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Sapinero, alt. 2285 m., 19 June, 1901, *Baker 176* (Gray Herb., U. S. Nat. Herb., Greene Herb., and Mo. Bot. Gard. Herb.); Black Cañon, alt. 2135 m., 12 June, 1901, *Baker 114* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Veta Pass, 15 July, 1896, *Shear 3592* (U. S. Nat. Herb.); Arboles, Archuleta Co., 15 June, 1899, *Baker 707* (Greene Herb., Berlin Herb., and Mo. Bot. Gard. Herb.), TYPE.

56. S. Burkei Greenm. Ottawa Nat. **25**:114. 1911; Ann. Mo. Bot. Gard. **2**:626, *pl. 20, fig. 1*. 1915.

An herbaceous perennial, glabrous or nearly so; stems erect, 3 to 9 dm. high, simple or rarely branched, striate; lower leaves petiolate, ovate-oblong, 1 to 7 cm. long, 1 to 3.5 cm. broad, obtuse or rounded at the apex, crenate to serrate-dentate, cuneate to subtruncate at the base; petioles 2 to 12 cm. long; stem-leaves petiolate and sublyrate to sessile and pinnatisect; inflorescence a terminal few to many-headed corymbose cyme; heads 10 to 12 mm. high, radiate; involucre campanulate, calyculate; bracts of the involucre usually 21, linear-lanceolate, 6 to 8 mm. long, glabrous or floccose-tomentulose, more or less tinged with purple; ray-flowers about 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: Minnesota to British Columbia.

Specimens examined:

Minnesota: Itaska Lake, 25 June, 1891, *Sandberg 1036* (U. S. Nat. Herb.).

Montana: Glacier National Park, 9 July, 1914, *Hitchcock 11831* (U. S. Nat. Herb.); open ground, shore of Lake McDonald, alt. 950 m., 25 July, 1901, *Vreeland* (U. S. Nat. Herb. and Geol. Surv. Canada Herb.); Columbia Falls, 1 July, 1894, *Williams 68* (U. S. Nat. Herb.).

Idaho: wet soil, Kootenai Co., alt. 650 m., *Leiberg* (Mo. Bot. Gard. Herb.).

Rocky Mountains: Grand Saline, "R. M. E. side", *Burke* (Gray Herb.), TYPE; river margins, Silver City, 7 Aug., 1885, *Macoun* (Gray Herb. and Geol. Surv. Canada Herb. 14772); swamps, Kicking Horse Lake, alt. 1540 m., 10 Aug., 1890, *Macoun* (Geol. Surv. Canada Herb. 14810).

Alberta: bank of Bow River, vicinity of Banff, alt. 1370 m., 20 July, 1899, *McCalla 2045* (U. S. Nat. Herb.); by the reservoir, Banff, 30 Oct., 1899, *Sanson* (Geol. Surv. Canada Herb. 22288); in vicinity of Banff, July, 1906, *Sanson* (Geol. Surv. Canada Herb. and Field Mus. Herb.); Banff, 28 July, 1904, *Farr* (Field Mus. Herb.); northern slopes of Crows Nest Pass, 31 July, 1887, *Macoun* (Geol. Surv. Canada Herb. 22785), in part.

British Columbia; open thicket, Spence's Bridge, 31 May, 1889, *Macoun* (Geol. Surv. Canada Herb. 14811), in part; cleared land at Homer Lake, 19 June, 1905, *Shaw 722* (Phil. Acad. Nat. Sci. Herb. and Mo. Bot. Gard. Herb.); Sophie Mountain, between Kettle and Columbia Rivers, 17 July, 1902, *Macoun 64990, 64991* (Gray Herb. and Geol. Surv. Canada Herb.); Skagit Valley, alt. 760–925 m., 21 Aug., and 10 July, 1905, *Macoun 69358, 69359* (Gray Herb. and Geol. Surv. Canada Herb.); shaded banks, mouth of Silica Creek, Chilliwack River, 29 June, 1901, *Macoun 26685* (Geol. Surv. Canada Herb., Greene Herb., and Gray Herb.), in part; on a bog, Chilliwack Lake, 19 July, 1901, *Macoun 26682, 26682a* (Geol. Surv. Canada Herb.); in a marsh east of Chilliwack Lake, 25

July, 1901, *Macoun* (Geol. Surv. Canada Herb., Gray Herb., and Mo. Bot. Gard. Herb.); Middle Creek, Chilliwack River, 2 Aug., 1901, *Macoun 26681* (Geol. Surv. Canada Herb. and Greene Herb.); in thicket by stream at 150-mile house, Cariboo, 15 July, 1900, *Wilson 700* (Geol. Surv. Canada Herb.).

57. S. gaspensis Greenm.[1]

An herbaceous perennial, commonly lightly floccose-tomentulose in the axils of the leaves; stems one to several from a common base, erect, 2.5 to 5 dm. high; lower leaves petiolate, broadly ovate to elliptic-lanceolate, .5 to 8 cm. long, 1 to 3.5 cm. broad, thin, glabrous on both surfaces, or sometimes in the early stages sparingly hairy, especially on the under surface, glabrate, rounded to obtuse at the apex, crenate-dentate, abruptly narrowed at the base into a slender petiole 1 to 12 cm. in length; inflorescence a terminal several-headed corymbose cyme; involucre campanulate, calyculate, glabrous or slightly pubescent; bracts of the involucre 13 to 21, linear-lanceolate, 4 to 6 mm. long; ray-flowers 8 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: Newfoundland, eastern Quebec, and northern Maine.

Specimens examined:

Newfoundland: meadow and damp talus on hill north of Tilt Cove, Notre Dame Bay, 22 Aug., 1911, *Fernald & Wiegand 6405* (Gray Herb.).

Quebec: cold walls of Percé Mountain, Percé, Gaspé Co., 25 July, 1905, *Williams, Collins & Fernald* (Gray Herb.),

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[1]**Senecio gaspensis** Greenm. sp. nov., herbaceus perennis ad basin et in axillis foliorum plerumque albo-flocculoso-tomentulosus; caulibus erectis 2.5–5 dm. altis; foliis inferioribus petiolatis late ovatis vel elliptico-lanceolatis .5–8 cm. longis 1 to 3.5 cm. latis membranaceis utrinque glabris vel juventa subtus sparse pubescentibus denique glabratis, ad apicem rotundatis vel obtusis, crenato-dentatis, ad basin abrupte contractis; petiolis gracilibus 1–12 cm. longis; inflorescentiis corymboso-cymosis terminalibus; capitulis 7–10 mm. altis, radiatis; involucris campanulatis glabris vel parce pubescentibus; bracteis involucri 13–21 lineari-lanceolatis 4–6 mm. longis; floribus femineis 8–12 ligulatis, ligulis flavibus; floribus disci numerosis longioribus quam squamae involucri; achaeniis glabris.—On cold walls of Percé Mountain, Percé, Gaspé Co., Quebec, 25 July, 1905, *Williams, Collins & Fernald* (Gray Herb.), TYPE; Grand Coupe, Percé, and Bonaventure Island, Gaspé Co., Aug., 1907, *Fernald & Collins 1204, 1205* (Gray Herb.); between the Forks and Brûlé Brook, Little Cascapedia River, Bonaventure Co., 29, 30 July, 1904, *Collins, Fernald & Pease* (Gray Herb. and U. S. Nat. Herb.); shaded alluvium, Fort Kent, Maine, 6 July, 1904, *Fernald* (Gray Herb.).

TYPE; cold northerly calcareous walls of the Grand Coupe, Percé, Gaspé Co., 6 Aug., 1907, *Fernald & Collins 1204* (Gray Herb.); limestone cliffs, Bonaventure Island, Gaspé Co., 7 Aug., 1907, *Fernald & Collins 1205* (Gray Herb.); alluvial thickets, between the Forks and Brûlé Brook, Little Cascapedia, *Collins, Fernald & Pease* (Gray Herb. and U. S. Nat. Herb.).

Maine: shaded alluvium, Fort Kent, 6 July, 1904, *Fernald* (Gray Herb.); rocky river flat, Fort Kent, 10 July, 1908, *Mackenzie 3418* (U. S. Nat. Herb. 648722).

58. S. Crawfordii Britt. Torreya **1**:21. 1901; Manual 1027. 1901, and ed. 2, 1905; Britton & Brown, Ill. Fl. **3**:545, *fig. 4628*. 1913.

S. Balsamitae var. *Crawfordii* (Britt.) Greenm. in Rhodora **10**:69. 1908, and in Gray, Manual, ed. 7, 854. 1908.

An herbaceous perennial, glabrous throughout or slightly tomentose on the base of the petioles and in the leaf-axils; stems erect, 3 to 6 dm. high; lower leaves long-petiolate, ovate to elliptic-lanceolate, the blades 1 to 8 cm. long, 1 to 3.5 cm. broad, rounded or obtuse at the apex, crenate to serrate-dentate, usually abruptly narrowed at the base, glabrous on both surfaces; petioles slender, 2 to 18 cm. long; stem-leaves petiolate and more or less lyrate to sessile and incised-serrate; inflorescence a few-headed corymbose cyme; heads about 1 cm. high, radiate; involucre campanulate, calyculate; bracts of the involucre 13 to 21, narrowly lanceolate, 6 to 8 mm. long, acute, glabrous, often purplish-tipped; ray-flowers 8 to 12, rays yellow, conspicuous; disk-flowers numerous; achenes glabrous.

Distribution: western New Jersey and southeastern Pennsylvania.

Specimens examined:

New Jersey: Assinipink Creek, near Trenton and New Brunswick trolley bridge, 28 May, 1904, *Brown* (Phil. Acad. Nat. Sci. Herb.); Abbott's meadow, below Trenton, 29 May, 1904, *Brown* (Phil. Acad. Nat. Sci. Herb.); Crosswick's Creek, 29 May, 1904, *Williamson* (C. S. Williamson Herb.); wet meadow between Springdale and Orchard, Camden Co., 20 May, 1905, *Stone* (Phil. Acad. Nat. Sci. Herb.).

Pennsylvania: in low wet ground, Tullytown, Bucks Co., 12 May, 1894, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); swamp, near Tullytown, 20 May, 1899, *Fretz* (Phil. Acad. Nat. Sci. Herb.); Tullytown, 30 May, 1899, and 22 May, 1900, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Tullytown, May, 1902, *Crawford & Brown* (Phil. Acad. Nat. Sci. Herb.); wet places in bog near Willow Grove, Montgomery Co., 25 May, 1899, *MacElwee 326* (Phil. Acad. Nat. Sci. Herb.); Fraser's bog, east of Willow Grove, 20 May, 1906, *Williamson* (Phil. Acad. Nat. Sci. Herb.); Fraser's bog, one mile southeast of Willow Grove, 17 and 23 June, 1902, *Van Pelt* (Phil. Acad. Nat. Sci. Herb.), form; Fraser's bog, near Bayer's Corner, 12 May, 1910, *Long 3307* (Phil. Acad. Nat. Sci. Herb.); near Philadelphia, 29 May, 1901, *Crawford* (Gray Herb.).

59. **S. quaerens** Greene, Leafl. Bot. Obs. & Crit. **1**:214. 1906; Wooton & Standley, Contr. U. S. Nat. Herb. **19**:747. 1915.

S. prionophyllus Greene, Leafl. Bot. Obs. & Crit. **1**:212. 1906, not *S. prionophyllus* Greene, Ottawa Nat. **15**:250. 1902.

An herbaceous perennial, glabrous or slightly white-floccose-tomentulose, especially towards the base of the stem, on the petioles, and in the leaf-axils; stems erect, 3 to 6 dm. high, rather leafy at the base, nearly naked above; lower leaves petiolate, subobovate to ovate-oblong, 1 to 8 cm. long, 1 to 3 cm. broad, rounded to obtuse at the apex, crenate to subserrate-dentate; petioles 1.5 to 14 cm. long; stem-leaves petiolate and sublyrate to sessile and more or less pinnatisect; inflorescence a one to many-headed corymbose cyme; heads about 1 cm. high, radiate; involucre campanulate, sparingly calyculate, slightly tomentulose at the base; bracts of the involucre linear-lanceolate, 5 to 7 mm. long, acute; ray-flowers 8 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of New Mexico.

Specimens examined:

New Mexico: moist places on the west fork of the Gila River, Mogollon Mountains, Socorro Co., alt. about 2285 m., 7 Aug., 1903, *Metcalfe 409* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.), TYPE; Willow Creek, Mogollon Mountains,

Socorro Co., 8 Aug., 1900, *Wooton* (U. S. Nat. Herb.); Santa Magdalena Mountains, June, 1881, *Vasey* (U. S. Nat. Herb.).

60. S. platylobus Rydb. Bull. Torr. Bot. Club **27**:181, *pl. 6, fig. 8.* 1900.

An herbaceous perennial, glabrous or essentially so; stems erect, 2.5 to 4 dm. high, striate; lower leaves petiolate, obovate or broadly oval, including the petiole 3.5 to 14 cm. long, 1 to 3 cm. broad, irregularly dentate; stem-leaves petiolate and sublyrate to sessile and pinnately divided into oblong to cuneate, rather conspicuous, rounded or acute lateral divisions; inflorescence a many-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre 13 to 21, lanceolate, acute, 5 to 6 mm. long, glabrous, somewhat stramineous; ray-flowers 10 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of Utah.

Specimens examined:

Utah: Wasatch Mountains, coll. of 1869, *Watson 671* (Torrey Herb.), TYPE; cañon bottoms, Provo, Wasatch Mountains, 16 June, 1902, *Goodding 1115* (Mo. Bot. Gard. Herb.); Red Rock Cañon, near Salt Lake City, 11 June, 1905, *Rydberg 6064* (U. S. Nat. Herb.); rich woods in mountain cañon, *Armstrong 336* (Margaret Armstrong Herb.); Mendon, 17 June, 1898, *Mulford 124* (Mo. Bot. Gard. Herb.).

There appears to have been some confusion of the material which was distributed by Dr. Watson under his number 671. The specimen in the United States National Herbarium agrees very well, particularly in habit and foliar characters, with typical forms of *S. crocatus,* but it differs markedly from Watson's 671 in the Gray Herbarium (which is apparently *S. rubricaulis* Greene) and likewise from the specimen bearing the same number in the Torrey Herbarium, namely the type of *S. platylobus* Rydb.

61. S. crocatus Rydb. Bull. Torr. Bot. Club **24**:299. 1897; *ibid.* **27**:177. 1900, in part; Mem. N. Y. Bot. Gard. **1**:446. 1900, at least as to synonymy; Fl. Colo. 396. 1906, in part; Greene,

Pittonia **4**:114. 1900; Nelson in Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909, in part; Daniels, Univ. Mo. Studies, Sci. Ser. **2**:252. 1911, in part.

S. aureus L.? var. *croceus* Gray, Proc. Acad. Nat. Sci. Phil. **15**:68. 1863, i. e., Hall and Harbour No. 332, in part, and Parry No. 405, not *S. croceus* DC.

S. aureus var. *croceus* Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886, in part.

S. longipetiolatus Rydb. Bull. Torr. Bot. Club **27**: 176. 1900; Fl. Colo. 396. 1906; Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909.

S. Tracyi Rydb. Bull. Torr. Bot. Club **33**:159. 1906; Fl. Colo. 397. 1906.

S. pyrrhochrous Greene, Pl. Baker. **3**:24. 1901.

An herbaceous perennial, glabrous throughout or slightly tomentulose in the axils of the bracts of the inflorescence; stems erect, 1 to 7.5 dm. high from a rather stout rootstock, striate; lower leaves petiolate, oblong-ovate, subcordate to abruptly contracted at the base, rounded, obtuse or submucronate at the apex, entire to somewhat crenate-dentate; petioles 1 to 12 cm. long; stem-leaves petiolate and sublyrate to sessile and semiamplexicaul; inflorescence a few to many-headed corymbose cyme; heads in anthesis 8 to 10 mm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre (13–) 21, linear-lanceolate, 5.5 to 8 mm. long, acute, glabrous, more or less tinged with purple; ray-flowers 10 to 12, rays orange-red or saffron-colored varying to yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of Colorado and Utah.

Specimens examined:

Colorado: Medicine Bow Mountains, 3 Aug., 1891, *Crandall* (U. S. Nat. Herb.); Rocky Mountain Flora, Lat. 39–41°, coll. of 1862, *Hall & Harbour 332* (Gray Herb.), in part, TYPE; Middle Park, coll. of 1862, *Parry 405* (Gray Herb., Mo. Bot. Gard. Herb., and U. S. Nat. Herb. 349244); without definite locality, *Wolf & Rothrock 581* (Gray Herb., U. S. Nat. Herb., and Phil. Acad. Nat. Sci. Herb.); Gray's Peak, July, 1888,

Eastwood (U. S. Nat. Herb.); Park Co., *Williamson* (C. S. Williamson Herb.); Dickey, below Breckenridge, 2 Sept., 1885, *ex Herb. Fritchey* (Mo. Bot. Gard. Herb.); near Breckenridge, coll. of 1892, *Wislizenus 1086,* and Aug., 1901, *Mackenzie 211* (Mo. Bot. Gard. Herb.); Mt. Baldy, 15 July, 1906, *Anderson* (Mo. Bot. Gard. Herb.); vicinity of Twin Lakes, 2 Aug., 1873, *Coulter* (Phil. Acad. Nat. Sci. Herb.); Mt. Lincoln, alt. 3650 m., 9 July, 1873, *Coulter* (U. S. Nat. Herb.); Weston's Pass, 18 July, 1873, *Coulter* (U. S. Nat. Herb.); damp meadows, Elk Mountains, coll. of 1881, *Brandegee* (Mo. Bot. Gard. Herb.); Jack's Cabin, Gunnison Co., alt. 2520 m., 26 Aug., 1901, *Baker 612* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); vicinity of Mount Carbon, Gunnison Co., alt. 2750 m., 6 July, 1910, *Eggleston 5866* (U. S. Nat. Herb.); Marshall Pass, 27 July, 1896, *Shear 5162* (U. S. Nat. Herb.); Sargents, Saguache Co., alt. 2580 m., 5 July, 1901, *Baker 348* (Gray Herb., U. S. Nat. Herb., Greene Herb., and Mo. Bot. Gard. Herb.); Silverton, 5 Aug., 1897, *Shear 4900* (U. S. Nat. Herb.); Hamor's Lake, north of Durango, alt. 2740 m., 24 July, 1898, *Baker, Earle & Tracy 625* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

Utah: Wasatch Mountains, alt. 1525 m., May, 1869, *Watson 671* (U. S. Nat. Herb.); Fish Lake, National Forest, alt. 2925 m., 19 July, 1913, *Arriveé* (U. S. Nat. Herb.).

Var. **Wolfii** Greenm. comb. nov.

S. Wolfii Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

Stems slender, 2 to 3 dm. high; lower leaves ovate-rotund to ovate-oblong, 7 to 20 mm. long, 5 to 13 mm. broad, rounded or obtuse at the apex, entire, subcordate to cuneate at the base. Similar to the species but somewhat more slender and with smaller leaves.

Distribution: mountains of Colorado.

Specimens examined:

Colorado: South Park, Lieut. Wheeler's Expedition, 1873, *Wolf & Rothrock 582, 586* (Gray Herb. and U. S. Nat. Herb.), TYPE; meadows, South Cottonwood Gulch, Chaffee Co., alt. 3050 m., 9 July, 1892, *Sheldon 481* (U. S. Nat. Herb.).

62. S. aquariensis Greenm.[1]

An herbaceous perennial, glabrous or slightly tomentulose in the inflorescence; stems erect, solitary or closely cespitose, 2 to 3.5 dm. high; lower leaves petiolate, ovate to oblong-lanceolate, 1 to 7 cm. long, .5 to 2 cm. broad, obtuse to acute, entire, glabrous on both surfaces; petioles 1 to 6 cm. long; stem-leaves petiolate and sublyrate to sessile, semiamplexicaul and more or less pinnatisect; inflorescence a terminal rather close corymbose cyme; heads numerous, 8 to 10 mm. high, sparingly calyculate, radiate; involucre campanulate; bracts of the involucre 13 (–21), lanceolate, 5 to 6 mm. long, acute, glabrous; ray-flowers 10 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: high plateaus of Utah.

Specimens examined:

Utah: Aquarius Plateau, alt. 3050 m., 5 Aug., 1875, *Ward 505* (Mo. Bot. Gard. Herb., Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Field Mus. Herb.), TYPE; Bear River Valley, coll. of 1877, *Palmer 267½* (Gray Herb., U. S. Nat. Herb. 782529 in part, and Mo. Bot. Gard Herb.).

63. S. dimorphophyllus Greene, Pittonia **4**:109. 1900; Rydb. Bull. Torr. Bot. Club **27**:178. 1900; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

S. heterodoxus Greene ex Rydb. Bull. Torr. Bot. Club **27**:178. 1900; Fl. Colo. 396. 1906, in synonymy.

S. aureus var. *croceus* Gray, Proc. Acad. Nat. Sci. Phil. **15**:68. 1863, i. e., Hall & Harbour No. 332, in part; Gray, Syn. Fl. N. Am. **1**[2]:391. 1884, and ed. 2, 1886, in part; Porter &

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[1]**Senecio aquariensis** Greenm. sp. nov., herbaceus perennis glabrus vel in inflorescentiis leviter tomentosus; caulibus erectis 2–3 dm. altis solitariis vel dense caespitosis; foliis inferioribus petiolatis ovatis vel oblongo-lanceolatis 1–7 cm. longis .5–2 cm. latis obtusis vel acutis integris vel paulo dentatis utrinque glabris ad basin abrupte cuneatis vel raro subcordatis; petiolis 1–6 cm. longis; foliis superioribus petiolatis et sublyratis vel sessilibus plus minusve pinnatisectis semiamplexicaulibusque; inflorescentiis terminalibus conferte corymboso-cymosis; capitulis numerosis 8–10 mm. altis parce calyculatis radiatis; involucris campanulatis; bracteis involucri 13 (–21) lanceolatis 5–6 mm. longis acutis glabris; floribus femineis 10–12, ligulis flavibus; floribus disci numerosis; achaeniis glabris.—Collected on the Aquarius Plateau, alt. 3050 m., 5 Aug., 1875, *Ward 505* (Mo. Bot. Gard. Herb., Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Field Mus. Herb.); Bear River Valley, coll. of 1877, *Palmer 267½* (Gray Herb., U. S. Nat. Herb. 782529 in part, and Mo. Bot. Gard. Herb.).

Coulter, Syn. Fl. Colo. 82. 1874, in part; Coulter, Manual Rocky Mountain Region 211. 1885, in part.

S. crocatus Rydb. Mem. N. Y. Bot. Gard. **1**:446. 1900, in part; Bull. Torr. Bot. Club **27**:177, *pl. 5, fig. 13*. 1900, as to description, illustration, and most of specimens cited, not as to synonymy; Fl. Colo. 396. 1906, mainly; Daniels, Fl. Boulder 252. 1911, mainly; Nelson in Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909, in part.

An herbaceous perennial, glabrous or essentially so throughout; stems one to several from a common base, erect or ascending, 1 to 3 dm. high; lower leaves ovate, subobovate, broadly spatulate or somewhat oblong-lanceolate, 1 to 4 cm. long, .5 to 2.5 cm. broad, rounded to obtuse at the apex, entire to crenate, narrowed at the base into a winged petiole equalling or exceeding the blade; stem-leaves mostly sessile, oblong-lanceolate to triangular-ovate, frequently conspicuously dilated at the base and amplexicaul; inflorescence a few to several-headed terminal corymbose cyme; heads about 1 cm. high, radiate; involucre campanulate, calyculate; bracts of the involucre about 21, linear-lanceolate, 6 to 7 mm. long, acuminate, acute, glabrous or slightly tomentulose, frequently reddish-tipped; ray-flowers 10 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of Wyoming and Colorado.

Specimens examined:

Wyoming: La Plata Mines, 21 Aug., 1895, *A. Nelson 1769* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); wet, subalpine woods, Nash's Fork, Albany Co., 15 Aug., 1908, *A. Nelson 9148* (Mo. Bot. Gard. Herb.); grassy ground, below snow, Bridges Peak, Carbon Co., 24 Aug., 1903, *Goodding 1980* (U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.).

Colorado: alpine meadows, summit of North Park Range, Larimer Co., 10 Aug., 1903, *Goodding 1820* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); about timberline, above Berthoud's Pass, 14 Sept., 1874, *G. Engelmann* (Mo. Bot. Gard. Herb.); timberline, Long's Peak, 5 Aug., 1886, *Letterman*

(Mo. Bot. Gard. Herb.); foot of Kelso Mountain, near Torrey's Peak, 14 Aug., 1885, *Letterman* (Mo. Bot. Gard. Herb.); Front Range, alt. 3500 m., 6 July, 1896, *Crandall* (Mo. Bot. Gard. Herb.); Grays Peak, above timberline, 31 Aug., 1884, *B. H. Smith* (Phil. Acad. Nat. Sci. Herb.); Grays Peak, alt. 3650–3800 m., 15 Aug., 1885, *Letterman* (Mo. Bot. Gard. Herb. and Field Mus. Herb.); Powell's Colorado Expl. Exp., 1868, Lat. 40–41°, *Vasey 340B* (Gray Herb. and Mo. Bot. Gard. Herb.); Lat. 39–41°, coll. of 1862, *Hall & Harbour 332* (U. S. Nat. Herb. 48721, Phil. Acad. Nat. Sci. Herb., and Field Mus. Herb. 314668); Lat. 39–41°, coll. of 1862, *Hall & Harbour 331* (U. S. Nat. Herb. 48766), in part, and *Hall & Harbour 115* (Gray Herb.), in part; without definite locality, coll. of 1871, *Brandegee 132* (Mo. Bot. Gard. Herb.); Breckenridge, coll. of 1892, *Wislizenus 1067* (Mo. Bot. Gard. Herb.); Mt. Parry, coll. of 1872, *Gray* (Gray Herb.); Golden City, 12 July, 1871, *Greene 528* (Gray Herb.); Golden, 13 July, 1885, *Letterman* (Mo. Bot. Gard. Herb.); Peak Valley, 21 Aug., 1901, *F. E. & E. S. Clements 485* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Cameron Pass, alt. 3500 m., 14 July, 1896, *Baker* (Mo. Bot. Gard. Herb.); meadows, South Cottonwood Gulch, Chaffee Co., alt. 3050 m., 9 July, 1892, *Sheldon 100* (U. S. Nat. Herb.); Gunnison Co., July, 1889, *Eastwood* (U. S. Nat. Herb.); Mineral Point, July, 1887, *Hempton* (Mo. Bot. Gard. Herb.); near Pagosa Peak, Mineral Co., alt. 3200 m., 6 Aug., 1899, *Baker 705* (Gray Herb., Berlin Herb., Greene Herb., and Mo. Bot. Gard. Herb.), TYPE; head of Vallecito, alt. 3000–3800 m., 2 Sept., 1903, *Knowlton 3* (U. S. Nat. Herb.); La Plata Mountains, alt. 3650 m., 15 July, 1896, *Tweedy 537* (U. S. Nat. Herb.); Little Kate Mine, La Plata Mountains, alt. 3500 m., 14 July, 1898, *Baker, Earle & Tracy 569* (Gray Herb., U. S. Nat. Herb., Greene Herb., and Mo. Bot. Gard. Herb.), TYPE of *S. heterodoxus* Greene; Farnham, 10 July, 1891, *E. C. Smith* (Mo. Bot. Gard. Herb.).

64. S. Farriae Greenm. Bot. Gaz. **42**:147. 1906; Contr. Bot. Lab. Univ. Penn. **3**:74. 1907; Ottawa Nat. **25**:115. 1911.

An herbaceous perennial, glabrous except for a persistent white tomentum in the axils of the leaves; stems erect or as-

cending, 1 to 3 dm. high, simple or branched from near the base; lower leaves ovate to slightly obovate, the blade 1 to 4 cm. long, 1 to 2.5 cm. broad, rounded at the apex, crenate to subentire, contracted at the base into a narrowly winged petiole equalling or exceeding the blade; stem-leaves petiolate and sublyrate to sessile and somewhat irregularly pinnatifid, the uppermost leaves reduced to mere bracts; heads about 1 cm. high, radiate; involucre campanulate, slightly calyculate, sparingly tomentulose at the base; bracts of the involucre about 21, linear-lanceolate, 7 to 8 mm. long, frequently red-dish-tipped; ray-flowers 10 to 14, rays yellow; disk-flowers numerous, 50 to 60; achenes glabrous.

Distribution: mountains of Alberta to Washington.

Specimens examined:

Alberta: near Banff, alt. 1500 m., 8 June, 1904, *Farr* (Univ. Penn. Herb. and Field Mus. Herb.), TYPE; vicinity of Banff, July, 1906, *Sanson 81260* (Geol. Surv. Canada Herb. and Mo. Bot. Gard. Herb.); vicinity of Basin, near Banff, alt. 1400 m., 8 and 18 June, 1906, *Brown 20* (Phil. Acad. Nat. Sci. Herb.); in deep moss in stream-bed below warm sulphur spring, vicinity of Banff, alt. 1370 m., 15 June, 1899, *McCalla 2049* (U. S. Nat. Herb.); Sulphur Springs, Banff, alt. 1415 m., 11 June, 1906, *Butters & Rosendahl 1324* (Field Mus. Herb.); Crows Nest Lake, alt. 1385 m., 9 July, 1883, *Dawson* (Geol. Surv. Canada Herb. 14800), in part; Devil's Head Lake, alt. 1385 m., 13 July, 1899, *Sanson* (Geol. Surv. Canada Herb. 22125); crossing of McLeod's River, 19 June, 1898, *Spreadborough* (Geol. Surv. Canada Herb. 19725); in grass along Bragg's Creek, Elbow River, 26 June, 1897, *Macoun* (Geol. Surv. Canada Herb. 22784); damp places, Red Deer, coll. of 1895, *Gaetz* (Geol. Surv. Canada Herb. 11622).

Washington: on rocky bar of Columbia River at Wenatchee, 25 May, 1899, *Whited 1096* (U. S. Nat. Herb.).

65. S. Hartianus Heller, Bull. Torr. Bot. Club **26**:622. 1899.

S. flavulus Wooton & Standley, Contr. U. S. Nat. Herb. **19**:747. 1915, in part, not Greene.

An herbaceous perennial, at first somewhat white-tomentulose, later more or less glabrate; stems erect, 2 to 5 dm. high,

lower leaves petiolate, ovate-rotund, ovate-oblong to subobovate, 1 to 3.5 cm. long, .5 to 2 cm. broad, rounded to obtuse at the apex, minutely crenate to serrulate, subcordate to abruptly contracted to a cuneate base; petioles 1 to 6.5 cm. long; inflorescence a few to many-headed corymbose cyme; heads 6 to 10 mm. high, radiate; involucre campanulate, sparingly calycular, tomentulose; bracts of the involucre 13 to 21, linear, 4 to 6 mm. long; ray-flowers about 12, rays pale yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of New Mexico and Arizona.

Specimens examined:

New Mexico: Winsor's Ranch, Pecos River National Forest, alt. 2500 m., 30 June, and 3 July, 1908, *Standley 4058, 4061, 4165* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); marsh, Kingston, Sierra Co., alt. 2000 m., 25 May, 1904, *Metcalfe 931* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

Arizona: vicinity of Flagstaff, alt. 2135 m., 5 July, 1898, *MacDougal 230* (Gray Herb. and Phil. Acad. Nat. Sci. Herb.), TYPE; San Francisco Mountains, 7 July, 1892, *Toumey 663* (Gray Herb. and U. S. Nat. Herb.); San Francisco Mountains, 21 Aug., 1889, *Knowlton 64* (U. S. Nat. Herb.); Mt. Agassiz, coll. of 1884, *Lemmon 3283* (Gray Herb.); near Kendrick Mountains, alt. 2000 m., 7 July, 1901, *Leiberg 5663* (U. S. Nat. Herb.); Cooley's Ranch, Navajo Co., 1 July, 1912, *Goodding 1108* (U. S. Nat. Herb.).

66. S. plattensis Nutt. Trans. Am. Phil. Soc. N. S. **7**:413. 1841; Britton & Brown, Ill. Fl. **3**:478, *fig. 4039*. 1898, and ed. 2, 543, *fig. 4623*. 1913; Heller, Cat. N. Am. Pl. 146. 1898, and ed. 2, 230. 1900; Rydb. Mem. N. Y. Bot. Gard. **1**:445. 1900, and Bull. Torr. Bot. Club **27**:185, *pl. 6, fig. 14*. 1900; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Britton, Manual 1026. 1901, and ed. 2, 1905; Rydb. Fl. Colo. 396. 1906; Coulter & Nelson, Manual Cent. Rocky Mountains 581. 1909; Daniels, Univ. Mo. Studies, Sci. Ser. **2**:251. 1911.

S. balsamitae Torr. in Nicollet's Report, App. B, 153 [237]. 1843, not Muhl.

S. aureus var. *Balsamitae* Torr. & Gray, Fl. N. Am. **2**:442. 1843, in part; Gray in Boston Jour. Nat. Hist. **6**:231. 1857; Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886, in part.

S. camporum Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

S. pseudotomentosus Mack. & Bush, Trans. Acad. Sci. St. Louis **12**:88, *pl. 17*. 1902.

An herbaceous perennial, usually more or less persistently white-floccose-tomentulose, rarely glabrous throughout; stems erect, one to several from a common base, 1 to 4 dm. high; leaves variable, the lower ovate-oblong to lanceolate or somewhat oblanceolate, 1 to 8 cm. long, .5 to 4 cm. broad, rounded to obtuse at the apex, crenate to serrate-dentate, subcordate to gradually narrowed at the base; petioles 1 to 15 cm. long; stem-leaves petiolate and sublyrate to sessile and very irregularly pinnatisect; inflorescence a terminal corymbose cyme; heads usually numerous, 8 to 10 mm. high, radiate; involucre campanulate, calyculate; bracts of the involucre 13 (–21), linear-lanceolate, 5 to 6 mm. long, glabrous or slightly tomentulose, penicillate; ray-flowers 10 to 12, rays yellow; disk-flowers numerous; achenes usually hispidulous along the angles, sometimes glabrous.

Distribution: southwestern Ontario to Saskatchewan and eastern Montana, south to Louisiana and Texas.

Specimens examined:

Ontario: on sand dunes, Port Franks, Lambton Co., 24 May, 1906, and 9 Aug., 1907, *Dodge 298, 108* (U. S. Nat. Herb.); Camlachie, 18 June, 1901, *Macoun* (Gray Herb. and U. S. Nat. Herb.); northeast of Sarnia, 5 June, 1897, *Dodge 297* (U. S. Nat. Herb.).

Manitoba: Stony Mountain, 14 June, 1887, *Fowler* (Mo. Bot. Gard. Herb.); open places south of Sewell, 12 June, 1876, *Macoun 12232* (Geol. Surv. Canada Herb.); gravelly or rocky places, Fort Ellice, 20 June, 1879, *Macoun 14799* (Geol. Surv. Canada Herb.).

Saskatchewan: Long Lake (Last Mountain Lake), 6 July, 1879, *Macoun 48* (Gray Herb.).

Michigan: dry fields and dryish woods, near Rochester, 2 June, 1912, and 25 May, 1913, *Farwell 2616, 3383, 3394* (Mo. Bot. Gard. Herb.); sterile hills, and in marl beds, Parkdale Farm, 2 June, 1912, 25 May, and 8 June, 1913, and 30 May, 1914, *Farwell 2608, 3414, 3443, 3655* (Mo. Bot. Gard. Herb.); dry soil in oak openings, Grand Rapids, 12 June, 1893, *Cole* (Gray Herb.); without definite locality, coll. of 1902, *H. L. Clark* (U. S. Nat. Herb. 413298).

Indiana: Notre Dame, 2 June, 1908, *Nieuwland*, and 14 May, 1913, *Nieuwland 11079* (Mo. Bot. Gard. Herb.).

Wisconsin: Fort Howard, on beaver dam, 15 June, 1878, *Schuette* (U. S. Nat. Herb. and Field Mus. Herb.).

Illinois: gravelly bluffs, Ringwood, coll. of 1860, *Vasey* (Gray Herb.); moist prairie, near Wady Petra, 20 May, 1896, *Chase* (Mo. Bot. Gard. Herb.); dry gravelly soil, Peoria, May and June, 1904, *McDonald* (Gray Herb.); vicinity of Oquawka, *Patterson* (Gray Herb. and Field Mus. Herb.); Mississippi River valley opposite St. Louis, 13 May, 1874, *Eggert* (Gray Herb., U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); dry hills, French Village, 14 May, 1875, 14 May, 1878, and 8 May, 1892, *Eggert* (Mo. Bot. Gard. Herb.); French Village, 23 April, 1878, *Eggert* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); French Village, 17 May, 1894, *Glatfelter* (Mo. Bot. Gard. Herb.); bluffs, near Belleville, April, 1834, (?) *Engelmann 592* (Mo. Bot. Gard. Herb.); without definite locality, *Brendel* (Berlin Herb. and Gray Herb.).

Missouri: Windsor Springs, 26 April, 1890, *Hitchcock* (Mo. Bot. Gard. Herb.); Cliff Cave, 3 May, 1901, *J. H. Kellogg* (Mo. Bot. Gard. Herb.); Kimmswick, 10 May, 1885, *Wislizenus 226* (Mo. Bot. Gard. Herb.), in part; Kimmswick, 9 May, 1915, *Drushel 1262* (Mo. Bot. Gard. Herb. and J. A. Drushel Herb.); sandy rocks, near Crystal City, 20 May, 1887, *Eggert* (Mo. Bot. Gard. Herb.); Potosi, 3 June, 1892, *Dewart 96* (Mo. Bot. Gard. Herb.); dry ground, near Bismarck, 30 April, 1893, *Eggert* (Mo. Bot. Gard. Herb.); Monteer, 24 May, 1900, 13 May, 1901, 2 May, 1902, and 27 April, 1907, *Bush 711, 455, 1487* and *4338* (Mo. Bot. Gard. Herb.); Grandin, 5 May, 1901, *Bush 344* (Mo. Bot. Gard. Herb.); Grandin, 6 May, 1905,

Bush 2706, 2706A (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Butler Co., 1 May, 1905, *Bush 2558* (Mo. Bot. Gard. Herb.); Pleasant Grove, 20 May, 1900, *Bush 336* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Pleasant Grove, 21 May, 1900, *Bush 363* (Mo. Bot. Gard. Herb.); Jerome, 28 April, 1914, *J. H. Kellogg 453* (Mo. Bot. Gard. Herb.); Springfield, 28 April, 1888, *Weller 683* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Watson, 1 June, 1894, *Bush 180* (Gray Herb. and Mo. Bot. Gard. Herb.); prairies, Lee's Summit, 9 May, 1897, *Bush 349* (Mo. Bot. Gard. Herb.); in woods, Courtney, 24 May, 1903, *Bush 1830* (Mo. Bot. Gard. Herb.); wooded hills, Courtney, 12 May, 1913, *Bush 6995* (Mo. Bot. Gard. Herb.); rocky woods, Dodson, 5 May, 1914, *Bush 7105* (Mo. Bot. Gard. Herb.); sandy hills and low prairies, Cass Co., May–June, 1885, and April, 1871, *Broadhead* (Mo. Bot. Gard. Herb.); prairies, Webb City, 4 May, 1902, *E. J. Palmer 314* (Mo. Bot. Gard. Herb.); high prairies, Carthage, 14 May, 1911, and 4 May, 1913, *E. J. Palmer 3373, 3383, 3942* (Mo. Bot. Gard. Herb.); high sandy prairies, Alba, 7 May, 1914, *E. J. Palmer 5518* (Mo. Bot. Gard. Herb.); Eagle Rock, 14 June, 1897, *Bush 182* (Mo. Bot. Gard. Herb.); McDonald Co., 22 April, 1891, *Bush* (Mo. Bot. Gard. Herb.).

Arkansas: Corning, May, 1884, *Letterman* (Berlin Herb., fragment in Gray Herb.); "Monark," 2 May, 1905, *Bush 2592* (Mo. Bot. Gard. Herb.).

Louisiana: west of Meriden, 15 April, 1901, *Canby, Sargent, Trelease & Bush 144* (Phil. Acad. Nat. Sci. Herb.); without definite locality, *Bradbury* (Phil. Acad. Nat. Sci. Herb.); "Upper Louisiana," *Nuttall* (Phil. Acad. Nat. Sci. Herb.), (?) TYPE; without definite locality, *Hale, ex Short Herb.* (Phil. Acad. Nat. Sci. Herb.).

Minnesota: Houston Co., May, 1912, *Freiberg* (Mo. Bot. Gard. Herb.); railroad banks, Perham, Ottertail Co., 20 July, 1912, *Chandonnet* (Mo. Bot. Gard. Herb.).

Iowa: Fayette Co., 3 June, 1894, *Fink 10* (U. S. Nat. Herb.); Iowa City, *Hitchcock* (Mo. Bot. Gard. Herb.); dry

hillsides, Lee Co., 19 May, 1914, *Rev. John Davis 2371, 3822* (Mo. Bot. Gard. Herb.); low ground on prairies, Armstrong, 14 June, 1883, and 5 June, 1898, *Cratty* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Burnside, 1 June, 1899, *Somes C. 3014* (U. S. Nat. Herb.); wet meadows, Decatur Co., 28 May, 1898, *Anderson* (Mo. Bot. Gard. Herb.); dry hills, near Council Bluffs, Nicollet's North-Western Expedition, 16 May, 1839, *Geyer 98* (Phil. Acad. Nat. Sci. Herb., Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); without definite locality, 9 June, 1875, *Arthur* (Mo. Bot. Gard. Herb.).

North Dakota: Conway, 2 July, 1896, *Brannon 193* (Mo. Bot. Gard. Herb.); dry prairie, Grand Forks, 12 June, 1896, *Brannon 232* (Mo. Bot. Gard. Herb.); on level prairie, Rogers, 10 June, 1912, *Bergman 1696* (Mo. Bot. Gard. Herb.); along bottom of open ravine, Adrian, 27 June, 1912, *Bergman 1808* (Mo. Bot. Gard. Herb.); wet prairie, Leeds, 11 June, 1899, *Lunell* (Gray Herb.).

South Dakota: prairies, "Oakwood," 23 May, 1902, *A. G. J.* (Mo. Bot. Gard. Herb.); Brookings, coll. of 1892, *Williams* (U. S. Nat. Herb.); Brookings, 20 June, 1893, *Thornber* (Mo. Bot. Gard. Herb.); Brookings, June, 1905, *White* (Mo. Bot. Gard. Herb.); Sioux Falls, 18 May, 1894, *Thornber* (Mo. Bot. Gard. Herb.); Fort Pierre to Yellowstone River, Raynolds' Expedition to the Headwaters of the Missouri and Yellowstone Rivers, July, 1859, *Hayden* (Mo. Bot. Gard. Herb.); grassy draws on plains, Washabaugh Co., 22 May, 1914, *Over 2088* (U. S. Nat. Herb.); Black Hills, near Fort Meade, 21 June, 1887, *Forwood 231* (U. S. Nat. Herb.); Custer, 16 July, 1892, *Rydberg 827* (Gray Herb.), in part; Hot Springs, 18 June, 1892, *Rydberg 828* (Gray Herb. and U. S. Nat. Herb.); Mayo, 18 June, 1914, *Over 1895* (U. S. Nat. Herb.).

Montana: Miles City, 26 May, 1902, *Blankenship* (Gray Herb.).

Nebraska: one hundred miles above Council Bluffs, 4 June, 1853, *Hayden* (Mo. Bot. Gard. Herb.); Mauvaises Terres, 12 July, 1853, *Hayden* (Mo. Bot. Gard. Herb.); Fremont, 3 June, 1893, *Schenck 6* (Mo. Bot. Gard. Herb.); prairies near Lincoln,

June, 1887, *Webber*, also 10 and 12 May, 1900, *Hedgcock* (Mo. Bot. Gard. Herb.); Minden, 11 June, 1907, *Hapeman* (Mo. Bot. Gard. Herb.); Big Blue and Little Blue Rivers to Big Platte River, June, 1849, *Fendler 71* (Gray Herb.); Republican Valley, Franklin Co., 15 May, 1893, *Laybourn* (Mo. Bot. Gard. Herb.); Hershey, 20 May, 1903, *Mell 46* (U. S. Nat. Herb.); along streams, Halsey, 27 May, 1903, *Mell & Knopff* (Mo. Bot. Gard. Herb.); Platte bottom, Kearney Co., 15 June, 1891, also Cheyenne Co., 3 Aug., 1891, *Rydberg 211* (U. S. Nat. Herb.); Nebraska (?), Stevens' Pacific Railway Expedition (U. S. Nat. Herb. 48724, 48726).

Colorado: near Evans and Greeley, colls. of June, 1907, 1908, and 1909, *E. L. Johnston 439, 441, 443, 445, 460, 546* (Mo. Bot. Gard. Herb.); New Windsor, Weld Co., 4 June, 1901, *Osterhout* (U. S. Nat. Herb. and Phil. Acad. Nat. Sci. Herb.); Fort Lupton, in Platte River bed, 19 May, 1 and 15 June, 1913, *E. L. Johnston 884, 872, 868* (U. S. Nat. Herb.); river flats, Fort Collins, alt. 1525 m., 17 May, 1895, *Crandall 281* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); cañon of the Cache-la-Poudre, 2 June, 1891, *Crandall* (U. S. Nat. Herb.); Denver, Lieut. Wheeler's Expedition, June, 1873, *Wolf 556* (U. S. Nat. Herb.); low meadows on Clear Creek, 23 May, 1870, *Greene 226* (Gray Herb.); near Breckenridge, 22 July, 1906, *Anderson* (Mo. Bot. Gard. Herb.); Horsetooth Gulch, 28 May, 1898, *Crandall 3070* (U. S. Nat. Herb.); wet meadow valley, 20 June, 1873, *Brandegee* (Mo. Bot. Gard. Herb.).

Kansas: Manhattan, coll. of 1884, *Kellerman 8* (Gray Herb.); Manhattan, 15 May, 1887, *Kellerman* (Mo. Bot. Gard. Herb.); Manhattan, 6 May, 1891, *Fritz* (U. S. Nat. Herb.); stony hills, Riley Co., 9 May, 1895, and coll. of 1896, *Norton 303* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Emporia, 29 April, 1890, *Tyler* (Mo. Bot. Gard. Herb.); Cowley, *White* (Mo. Bot. Gard. Herb.); dry prairies, near Osborne City, 14 May, 1894, *Shear 28* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

Oklahoma: Huntsville, Kingfisher Co., 29 April, 1896, *Blankenship* (Gray Herb., U. S. Nat. Herb., and Mo. Bot.

Gard. Herb.); Sapulpa, 29 and 30 April, 1895, *Bush 1249, 975* (Mo. Bot. Gard. Herb.); between Fort Cobb and Fort Arbuckle, *Palmer 461* (U. S. Nat. Herb.); without definite locality, 16 April, 1893, *Waugh 275* (Mo. Bot. Gard. Herb.); without locality, *Stevens 34, 50.2A, 120, 134, 146, 163, 179.6A, 210, 233, 286½, 301½, 420H, 469* (Geo. W. Stevens Herb.).

Texas: rich woods, Dallas, March, 1882, *Reverchon 556* (Mo. Bot. Gard. Herb.); on prairie, Dallas, 15 April, 1900, *Bush 606* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); rocky prairies, Fort Worth, 21 April, 1902, *Reverchon* (Mo. Bot. Gard. Herb.); hillsides, Polytechnic, 5 March, 1913, *Ruth 54* (Mo. Bot. Gard. Herb.); Limestone Co., March, 1878, *Joor* (U. S. Nat. Herb.); College Station, Brazos Co., *Ness 2083* (Mo. Bot. Gard. Herb.); sandy prairies, Terrell, 6 April, 1903, *Reverchon 3964* (Gray Herb. and Mo. Bot. Gard. Herb.); Round-top Mountain, Comanche Co., 9 May, 1900, *Eggert* (Mo. Bot. Gard. Herb.); Georgetown, March, 1890, *Bodin 53* (U. S. Nat. Herb); Gillespie Co., *ex Herb. Jermy* (Mo. Bot. Gard. Herb.); New Braunfels, April, 1851, *Lindheimer* (Mo. Bot. Gard. Herb.); in patches on rocky high plains, Upper Guadeloupe, coll. of March, 1846, *Lindheimer 445* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.).

67. **S. Willingii** Greenm. Ottawa Nat. **25**:117. 1911.

An herbaceous perennial, somewhat glaucous; stems erect, 2.5 to 3 dm. high, glabrous, striate, leafy; leaves oblong-lanceolate, 3 to 12 cm. long, .7 to 2 cm. broad, crenate-serrate to pinnately divided into oblong, entire or obtusely dentate lobes obtuse to rounded at the apex, in the early stages floccose-tomentulose along the midrib and lateral nerves beneath and on the margins of the petioles, later glabrate; inflorescence a terminal, rather dense, corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, calyculate, sparingly floccose-tomentulose, glabrate; bracts of the involucre about 21, linear-lanceolate, 6 to 7 mm. long, acute; ray-flowers about 12, rays yellow; disk-flowers numerous, 60 to 70; achenes glabrous.

Distribution: Manitoba to Alberta.

Specimens examined:

Manitoba: gravelly soil, Ninga, 1 June, 1908, *Hales 24* (Geol. Surv. Canada Herb.).

Alberta: near Olds, Aug., 1894, *Willing* (Geol. Surv. Canada Herb. 14843, 6063, fragment and photograph in Field Mus. Herb.), TYPE.

68. S. Smallii Britt. Mem. Torr. Bot. Club **4**:132. 1894; Britton & Brown, Ill. Fl. **3**:479, *fig. 4044*. 1898, and ed. 2, 546, *fig. 4630*. 1913; Heller, Cat. N. Am. Pl. 147. 1898, and ed. 2, 231. 1900; Britton, Manual 1028. 1901, and ed. 2, 1905; Small, Fl. Southeastern U. S. 1304. 1903, and ed. 2, 1913; Greenm. in Gray, Manual, ed. 7, 854. 1908.

S. Balsamitae Ell. Sketch **2**:330. 1824, not Muhl.

S. aureus var. *Balsamitae* Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2. 1886, in part; Chapman, Fl. Southern U. S. 245. 1860, ed. 2, 1889, and ed. 3, 266. 1897.

S. aureus var. *angustifolius* Britt. Mem. Torr. Bot. Club **2**:39. 1890, not *S. angustifolius* Willd.

S. Earlei Small, Bull. Torr. Bot. Club **25**:147. 1898.

(?) *S. Memmingeri* Britt. Bull. Torr. Bot. Club **25**:147. 1898.

An herbaceous perennial; stems one to several, erect from a common base, 2 to 6 dm. high, conspicuously and permanently woolly tomentose at the base and in the leaf-axils; lower leaves long-petiolate, narrowly oblong-oblanceolate, 1.5 to 13 cm. long, 1 to 3 cm. broad, obtuse to rounded at the apex, crenate to serrate-dentate, narrowed at the base into the petiole; petioles 1.5 to 18 cm. long; stem-leaves petiolate and sublyrate to sessile and more or less pinnatisect; inflorescence a terminal many-headed corymbose cyme; heads usually very numerous, relatively small, 7 to 10 mm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre 13 to 21, linear-lanceolate, 5 to 6 mm. long, glabrous; ray-flowers 8 to 13, rays yellow; disk-flowers numerous; achenes usually but not always hispidulous along the angles.

Distribution: southern Pennsylvania to Florida.

Specimens examined:

Pennsylvania: Tullytown, Bucks Co., 15 May, 1896, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Westtown, Chester Co., 22 June, 1895, *Crawford* (Phil. Acad. Nat. Sci. Herb.); near Mt. Hope, in red sandstone, Lancaster Co., 24 June, 1901, *Heller* (Mo. Bot. Gard. Herb.).

Maryland: Baldfriar, Cecil Co., 4 July, 1907, *Bartram* (Phil. Acad. Nat. Sci. Herb.); Norbeck, 25 June, 1895, *Mearns* (U. S. Nat. Herb.); between Garrett Park and Kensington, 8 June, 1907, *Steele* (U. S. Nat. Herb.); field above Cabin John, 7 June, 1908, *Steele* (U. S. Nat. Herb.); dry slopes, Chevy Chase Lake, 30 May, 1911, *Standley 5983* (U. S. Nat. Herb.).

District of Columbia: vicinity of Washington, 10 June, 1877, and 27 May, 1878, *Ward* (U. S. Nat. Herb. 131112 in part, and 131111); Queen's Chapel Road, 12 June, 1888, *Burgess* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Garrett Park, June, 1894, and in open thickets, Brookland, 6 June, 1895, *Holm* (Mo. Bot. Gard. Herb.); Rock Creek Park, 26 May, 1895, *Pollard 285* (U. S. Nat. Herb.); vicinity of Washington, 25 May, 1896, *Steele* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); wooded side-hill of Piney Branch, Rock Creek Park, 27 May, 1899, *Maxon 140* (U. S. Nat. Herb.); Chevy Chase, 16 May, 1905, *House 721* (Mo. Bot. Gard. Herb.); Tenallytown, 14 June, 1871, *F. Blanchard* (Mo. Bot. Gard. Herb.).

Virginia: Fairfax Co., 7 June, 1902, *G. S. Miller* (U. S. Nat. Herb.); West End, Fairfax Co., 30 June, 1907, *Steele* (U. S. Nat. Herb.); dry woods, Falls Church, 30 May, 1912, *Ruth 164* (U. S. Nat. Herb.); open woods, Bluemont, Loudon Co., 31 May, 1915, *Standley 11621* (U. S. Nat. Herb.); dry fields, Hampton, 19 May, 1903, *G. S. Miller* (U. S. Nat. Herb.); Richmond, *de Chalmont* (U. S. Nat. Herb.); near Suffolk, Nansemond Co., 19 May, 1898, *Kearney 1271* (U. S. Nat. Herb.); near Branchville, Southampton Co., 12 June, 1893, *Heller 958* (Phil. Acad. Nat. Sci. Herb. and Mo. Bot. Gard. Herb.); in old fields, vicinity of Belfield, 21 May, 1904, *Meyncke* (U. S. Nat. Herb.); Appomattox, *Rumer* (U. S. Nat. Herb.); pine

woods, Bedford Co., *A. H. Curtiss* (Gray Herb. and Mo. Bot. Gard. Herb.); Peaks of Otter, 6 June, 1890, *Brown, Hogg, Vail, Timmerman & Britton* (U. S. Nat. Herb. and Greene Herb.); between Fall Creek and Danville, 3 June, 1891, *Small & Heller 234* (U. S. Nat. Herb.); vicinity of Marion, Smyth Co., alt. 640 m., 6 June, 1892, *N. L. and E. Britton & Vail* (Phil. Acad. Nat. Sci. Herb.); Hutton's Branch, East Marion, alt. 760 m., 6 June, 1892, *Small* (Mo. Bot. Gard. Herb.); along Comer Creek, 15 June, 1892, alt. 915 m., *Small* (U. S. Nat. Herb.).

North Carolina: Weldon, *Williamson* (C. S. Williamson Herb.); vicinity of Heilig's Mill, Rowan Co., 4–9 June, 1891, *Small & Heller 490* (Mo. Bot. Gard. Herb.); in woods, near Faith, 27 May, 1891, *Heller 10263* (Mo. Bot. Gard. Herb.); Statesville, *Hyams* (Mo. Bot. Gard. Herb.); near Hickory, alt. 550 m., 23 June, 1893, *Heller* (Phil. Acad. Nat. Sci. Herb.); east of Blowing Rock, Caldwell Co., 24 June, 1893, alt. 1065 m., *Heller* (Phil. Acad. Nat. Sci. Herb.); dry open woods and clearings, Biltmore, 14 June, 1900, *Mohr* (U. S. Nat. Herb.); vicinity of Asheville, May, 1888, *McCarthy* (U. S. Nat. Herb.); dry woods and waste places, Biltmore, 20 May, 1896, *Biltmore Herb. 1233* (Mo. Bot. Gard. Herb.); old fields, Biltmore, 11 June, 1897, *Biltmore Herb. 1233b* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); "Half Way," Black Mountain, 27 June, 1902, *Harshberger 79* (U. S. Nat. Herb. and Phil. Acad. Nat. Sci. Herb.); Tryon, Polk Co., 22 May, 1899, *Churchill* (Gray Herb.); foot of mountain, Tryon, 22 May, 1897, *Townsend* (U. S. Nat. Herb.); Sunburst, Haywood Co., alt. 975 m., 19 June, 1910, *House 4339* (U. S. Nat. Herb.); without definite locality, June, 1879, *Gray, Sargent, Redfield & Canby* (Gray Herb.); on mountain bluff, *Gray & Carey* (Gray Herb.), small form.

South Carolina: Table Rock, Pickens Co., *Buckley* (Gray Herb.); dry woods and fields, Fort Hill, Oconee Co., 30 April, 1906, *House 1994* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); without locality, May, 1867, *Ravanel* (Gray Herb.).

Georgia: Gainesville, 10 May, 1879, *Trelease* (Mo. Bot. Gard. Herb.); dry woods on highest summit of Pigeon Moun-

tains, Walker Co., alt. 710 m., 1 Aug., 1900, *Harper 338* (U. S. Nat. Herb.); Lookout Mountain, July, 1898, *Ruth 673* (U. S. Nat. Herb.) and *704* (Mo. Bot. Gard. Herb.); Lookout Mountain, 25 May, 1901, *Trelease* (Mo. Bot. Gard. Herb.); Thompson's Mills and vicinity, Gwinnett Co., 26 April, 1908, *Allard 267, 268* (U. S. Nat. Herb.); Stone Mountain, 13 May, 1901, *A. H. Curtiss 6780* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Stone Mountain, 23 May, 1897, and 17 May, 1899, *Eggert* (Mo. Bot. Gard. Herb.); rocky places, Covesprings, 15 May, 1881, *Mohr* (U. S. Nat. Herb.); Tallapoosa, April and May, 1900, *Way 30* (U. S. Nat. Herb.); Lagrange, 16 May, 1905, *Tracy 8944* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); without definite locality, *Boykin* (Phil. Acad. Nat. Sci. Herb.).

Alabama: Wedowee, Randolph Co., 28 May, 1874, *Mohr* (U. S. Nat. Herb.); Auburn, Lee Co., colls. of 1897 and 1898, *Earle & Baker* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); dry, open places, Auburn, 10 June, 1901, *Earle* (Gray Herb.); Cullman, May, 1886, and June, 1895, *Mohr* (U. S. Nat. Herb.); without definite locality, June, 1889, *Miss Emily Mohr* (U. S. Nat. Herb. 782485).

Florida: without definite locality, *Chapman* (Gray Herb. and Mo. Bot. Gard. Herb.).

Tennessee: dry ground, Knoxville, May, 1898, *Ruth 672* (U. S. Nat. Herb.); dry sterile grounds, Knoxville, June, 1898, *Ruth 703* (Mo. Bot. Gard. Herb.).

This species, *S. Smallii,* and the following, *S. pauperculus,* are, as a rule, easily distinguished by the taller stems, longer leaves, more numerous and somewhat smaller heads of the former; but in southeastern Pennsylvania and in Maryland occasional forms occur, for example, Crawford's specimen from Tullytown, 15 May, 1896, and Small's specimen from Mt. Hope, 24 June, 1901, which are somewhat intermediate. These two specimens seem to the writer to possess rather more the characters of *S. Smallii* than of *S. pauperculus.* Moreover, Crawford's specimen from Westtown, Pa., 22 June, 1895, is a perfect match for Heller's specimen, No. 10263,

from North Carolina, as well as certain other collections from the southern states. The range of *S. Smallii* may be said therefore to extend to southern Pennsylvania.

69. S. pauperculus Michx.[1] Fl. Bor. Am. **2**:126. 1803; Pursh, Fl. Am. Sept. **2**:529. 1814, and ed. 2, 1816; DC. Prodr. **6**:432. 1837; Britton & Brown, Ill. Fl. **3**:545, *fig. 4629*. 1913.

S. Balsamitae Muhl. ex. Willd. Sp. Pl. **3**:1998. 1804; Pursh, Fl. Am. Sept. **2**:530. 1814, and ed. 2, 1816, excl. synonymy; Beck, Bot. Northern and Middle States 200. 1833, excl. synonym; Darlington, Fl. Cest. 497. 1837; Heller, Cat. N. Am. Pl. 146. 1898, and ed. 2, 229. 1900; Britton & Brown, Ill. Fl. **3**:479, *fig. 4043*. 1898; Britton, Manual 1027. 1901, and ed. 2, 1905, in major part; Greenm. in Rhodora **3**:5. 1901; Monogr. Senecio, I. Teil, 23. 1901, and in Engl. Bot. Jahrb. **32**:19. 1902; Porter, Fl. Penn. 339. 1903; Keller & Brown, Handb. Fl. Phil. and Vicinity 343. 1905; Greenm. in Gray, Manual, ed. 7, 854. 1908; Small, Fl. Lancaster County 310. 1913.

S. aureus var. *Balsamitae* Torr. & Gray, Fl. N. Am. **2**:442. 1843, in part; Torr. Nat. Hist. N. Y., pt. 2, Botany **1**:402. 1843; Britton, Cat. Pl. N. J. 54. 1881; *ibid.* 150. 1890; Gray, Syn. Fl. N. Am. **1**[2]:391. 1884, and ed. 2, 1886, in part; Macoun, Cat. Canadian Pl. 265. 1884, in major part.

S. Balsamitae var. *praelongus* Greenm. Rhodora **3**:6. 1901; Graves et al. Conn. Geol. and Nat. Hist. Surv. Bull. No. 14, p. 404. 1910.

An herbaceous perennial, somewhat tomentulose, particularly at the base of the stem and in the leaf-axils, to glabrous; stems erect or nearly so, one to several from a common base, 1 to 4 dm. high; lower leaves petiolate, narrowly oblong oblanceolate, including the petiole 2 to 18 cm. long, .5 to 2 cm. broad, rounded to obtuse at the apex, crenate to serrate-dentate, gradually narrowed at the base; stem-leaves petiolate and sublyrate to sessile and pinnatisect; inflorescence a terminal few to several-headed corymbose cyme, occasionally reduced to a single head; heads 5 to 10 mm. high, radiate; in-

[1]The name *pauperculus* is here maintained for this species instead of *Balsamitae* largely on the statement of Dr. Otto Kuntze, Rev. Gen. Pl. **1**: CXXXIV, CXXXV. 1891.

volucre campanulate, calyculate; bracts of the involucre (13–) 21, linear-lanceolate, 3 to 6 mm. long, usually glabrous; ray-flowers 8 to 13, rays yellow; disk-flowers numerous; achenes glabrous or hirtellous along the angles.

Distribution: Labrador to Minnesota, south to Virginia and Missouri.

Specimens examined:

Labrador: hills near lighthouse, Forteau, 23 Aug., 1894, *Waghorne 29* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); boggy spots, and in wet moss by spring, Blanc Sablon, Strait of Belle Isle, 1 Aug., 1910, *Fernald & Wiegand 4185, 4186* (Gray Herb.); wet limestone and calcareous sandstone terraces, Blanc Sablon, 6 Aug., 1910, *Fernald & Wiegand 4178* (Gray Herb.).

Newfoundland: damp limestone barrens, near sea-level, Pointe Riche, 4 Aug., 1910, *Fernald & Wiegand 4176* (Gray Herb.); dry rocky limestone barrens, near sea-level, Ingornachoix Bay, 4 Aug., 1910, *Fernald & Wiegand 4177* (Gray Herb.); barrens at the base of serpentine tablelands, Bonne Bay, 27 Aug., 1910, *Fernald & Wiegand 4179* (Gray Herb.); crests of sea cliffs, Western Head, New Worlds Island, Notre Dame Bay, 20 July, 1911, *Fernald & Wiegand 6407* (Gray Herb.); boggy places on hill, southwest of Tilt Cove, Notre Dame Bay, 25 Aug., 1911, *Fernald & Wiegand 6412* (Gray Herb.); Fogo Island, 27 July, 1903, *Sornborger* (Gray Herb.); ledges and talus, north bank of river below Grand Falls, 3 July, 1911, *Fernald & Wiegand 6402* (Gray Herb.); open bogs among the hills, Grand Falls, 23 July, 1911, *Fernald & Wiegand 6411* (Gray Herb.); bog, Grand Falls, 5 July, 1911, *Williamson* (C. S. Williamson Herb.); shingly beach, north bank of river, below Grand Falls, 22 July, 1911, *Fernald & Wiegand 6406* (Gray Herb.); gravelly river bank, Glenwood, 12 and 13 July, 1911, *Fernald & Wiegand 6403, 6404* (Gray Herb.); Tilton Harbor to Barred Island, 31 July, 1903, *Sornborger* (Gray Herb.); Barred Island, 13 Aug., 1903, *Sornborger* (Gray Herb.); swamp, foot of Helmet, Holyrood, 22 Aug., 1894, *Robinson & Schrenk* (Gray Herb.); near confluence

of Exploits River and Badger Brook, 13 Aug., 1894, *Robinson & Schrenk* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); sandy clearing, Mary Anne Brook, 14 July, 1911, *Fernald & Wiegand 6410* (Gray Herb.); dry bog, Millertown Junction, 7 July, 1911, *Fernald & Wiegand 6408* (Gray Herb.); damp talus slopes of the marble region between Mt. Musgrave and Humber Mouth (Bay of Islands Station), 18 July, 1910, *Fernald & Wiegand 4183* (Gray Herb.); gravelly beach, Middle Birchy Pond, 11 July, 1910, *Fernald & Wiegand 4182* (Gray Herb.); open tundra along Junction Brook, 12 and 13 July, 1911, *Fernald & Wiegand 6409* (Gray Herb.); boggy places on the hill back of Summerside, 11 July, 1910, *Fernald & Wiegand 4181* (Gray Herb.); open peat bog among Silurian hills, back of Birchy Cove (Curling), 8 July, 1910, *Fernald & Wiegand 4180* (Gray Herb.); serpentine and magnesian limestone barrens, northeastern bases and slopes of Blomidon (Blow-me-down) Mountains, 24 July, 1910, *Fernald & Wiegand 4184* (Gray Herb.); barrens at the base of serpentine table-lands, Bonne Bay, 27 Aug., 1910, *Fernald & Wiegand 4187* (Gray Herb.); fields, Coal River, 14 July, 1896, *Waghorne 15* (Gray Herb.), and 16 July, 1896, *Waghorne 12* (Mo. Bot. Gard. Herb.); sandy shore, Grand Lake, Bay of Islands, 11 Aug., 1896, *Waghorne 45* (Gray Herb.); sea-bank, near Chimney Cove, Bay of Islands, *Waghorne 8* (Gray Herb.); Bay of Islands, 24 June, 1895, *Waghorne 23* (Mo. Bot. Gard. Herb.), and 18 July, 1895, *Waghorne* (U. S. Nat. Herb.); open bog, Bay of Islands, 23 July, 1908, *Eames & Godfrey 8131* (Gray Herb.).

Quebec: rocky shores, River de Brig, Anticosti, 10 July, 1883, *Macoun* (U. S. Nat. Herb.); ravine, Mt. Albert, Gaspé Co., 26 July, 1881, *ex Herb. J. A. Allen* (U. S. Nat. Herb.); crevices and talus of serpentine, gulch north of Lac au Diable, Mt. Albert, Gaspé Co., alt. 750–950 m., 25 July, 1906, *Collins & Fernald 752* (Gray Herb.); cold wet rocks, head of au Diable, alt. 950 m., 8–15 Aug., 1905, *Collins & Fernald* (Gray Herb.); calcareous marl, Trout Pond, mouth of Grand River, Gaspé Co., 11–15 Aug., 1904, *Collins, Fernald & Pease* (Gray

Herb.); banks of Grand River, 20 June–10 July, 1903, *Richards* (Gray Herb.); banks of Grand River, Gaspé Co., 30 June–3 July, 1904, *Fernald* (Gray Herb.); gravelly beaches and flats, also wet alluvial shores, between Baldé and Baie des Chaleurs, Bonaventure River, 5, 6 and 7 Aug., 1904, *Collins, Fernald & Pease* (Gray Herb.); Gatineau River, 6 Sept., 1894, *Macoun* (Mo. Bot. Gard. Herb.); gravel beaches near the mouth of Dartmouth River, 26 and 27 Aug., 1904, *Collins, Fernald & Pease* (Gray Herb.), form with proliferous heads, also with both radiate and discoid heads.

Ontario: Plevna, 20 June, 1902, *Fowler* (Gray Herb.); sand ridges north of Sarnia, Lambton Co., 13 June, 1895, *Dodge 109* (U. S. Nat. Herb.); region of Lake Superior, *Macoun 52* (Mo. Bot. Gard. Herb.).

Maine: sunny alluvium, Fort Kent, 6 July, 1904, *Fernald* (Gray Herb.); rocky ledges, Fort Kent, 19 July, 1908, *Mackenzie 3600* (Mo. Bot. Gard. Herb.); rocky river-flat, Fort Kent, 10 July, 1908, *Mackenzie 3418* (Mo. Bot. Gard. Herb.); gravelly shores, Fort Fairfield, 5 July, 1893, *Fernald 71* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Pamedumcook Lake, 10 Aug., 1881, *Chickering* (Gray Herb. and U. S. Nat. Herb.); rocks in river, Orono, 1 July, 1890, *Fernald* (Gray Herb.).

New Hampshire: Sumner's Falls, 27 June, 1898, *Eggleston* (Mo. Bot. Gard. Herb.), and 25 June, 1902, *Eggleston 2804* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

Vermont: Colchester, coll. of 1842, *Oakes* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Winooski High Bridge, 14 June, 1881, *E. & C. E. Faxon* (Gray Herb.); Barnet, 20 June, 1884, *F. Blanchard* (Mo. Bot. Gard. Herb.); Manchester, 27 June, 1898, *Day 210* (Gray Herb. and U. S. Nat. Herb.); Bellows Falls, coll. of 1901, *W. H. Blanchard* (Gray Herb.); Putney, 8 June, 1902, *W. H. Blanchard* (Gray Herb.); without definite locality, *Robbins* (Phil. Acad. Nat. Sci. Herb.).

Massachusetts: Danvers, without date, *Oakes* (Phil. Acad. Nat. Sci. Herb.); without definite locality, *Oakes* (Gray

Herb.); rocky woods near summit of Blue Hill, Milton, *Rich* (Gray Herb.).

New York: Watertown, Jefferson Co., coll. of 1834, *Torr. & Gray, Fl. N. Am.* (Gray Herb.); rocky banks of Blue River, Watertown, 3 July, 1857, *ex Herb. Wm. Boott* (Gray Herb.); Dexter, *ex Herb. Geo. Vasey* (Gray Herb.); Oneida Co., coll. of 1864, *Paine* (Gray Herb.); sandy bog, near Syracuse, 22 June, 1882, *Sheldon* (Phil. Acad. Nat. Sci. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); tamarack swamp, near Syracuse, 28 May, 1902, *House* (U. S. Nat. Herb.).

New Jersey: low meadows, Newfoundland, Morris Co., 14 June, 1908, *Mackenzie 3119* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); dry woods, Chatham, 30 May, 1903, *Mackenzie 182* (Mo. Bot. Gard. Herb.); dry fields, Murray Hill, Union Co., 30 May, 1906, *Mackenzie 2044* (Mo. Bot. Gard. Herb.); Somerset Co., *Perry* (Mo. Bot. Gard. Herb.).

Pennsylvania: Laanna, Pike Co., 9 June, 1906, *Long* (Phil. Acad. Nat. Sci. Herb.); Allentown, 18 June, 1899, *Dowell* (U. S. Nat. Herb.); Manganese Park, southeast of Allentown, 8 June, 1908, near Mountainville, 13 June, 1908, and 13 June, 1914, also near Lanark, 24 May, 1908, *Pretz 1232, 1253, 6636, 1197* (Phil. Acad. Nat. Sci. Herb.); Nockamixon, Bucks Co., June, 1892, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Rockhill, 19 June, 1892, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); Perkasie, June, 1881, *Fretz* (Phil. Acad. Nat. Sci. Herb.); Tunnel Hill near Perkasie, 31 May, 1903, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); Perkasie, 30 May, 1906, *Brown* (Phil. Acad. Nat. Sci. Herb.); near Sellersville, 7 June, 1893, *Porter* (Phil. Acad. Nat. Sci. Herb.); along Perkiomen Creek, near Sellersville, 2 June, 1899, *MacElwee 408* (Phil. Acad. Nat. Sci. Herb.); Argus, 6 June, 1898, *Fretz* (Phil. Acad. Nat. Sci. Herb.); Aquetong, 30 May, 1910, *Keller* (Phil. Acad. Nat. Sci. Herb.); Sumneytown, 30 May, 1903, *Jahn,* and 30 May, 1905, *Keller* (Phil. Acad. Nat. Sci. Herb.); Sumneytown, 30 May, 1903, *Williamson* (C. S. Williamson Herb.); dry fields along Wissahickon Creek, Penllyn, 12 June, 1909, *Long* (Phil. Acad. Nat. Sci. Herb.); between Hillside and Ardsley, 12 Oct., 1907, *Long*

(Phil. Acad. Nat. Sci. Herb.); near Noble, 13 June, 1912, *Long 7085* (Phil. Acad. Nat. Sci. Herb.); Layfayette, 2 June, 1895, *Keller, Jahn,* also *Uselma C. Smith 816* (Phil. Acad. Nat. Sci. Herb.); Layfayette, 5 June, 1897, *Jahn* (Phil. Acad. Nat. Sci. Herb.); serpentine barrens, Newtown, Delaware Co., 25 June, 1901, *Benj. H. Smith* (Phil. Acad. Nat. Sci. Herb.); serpentine barrens, near Newtown Square, 12 June, 1899, *MacElwee 491, 505* (Phil. Acad. Nat. Sci. Herb.); Williamson, 4 June, 1891, *Crawford,* 28 July, 1899, *MacElwee 999,* and 11 June, 1911, *Pennell 2764, 3641* (Phil. Acad. Nat. Sci. Herb.); Media, 30 May, 1896, *Githens* (Phil. Acad. Nat. Sci. Herb.); Elwyn, 8 June, 1890, *Brinton,* and 9 June, 1890, *ex Herb. Beringer* (Phil. Acad. Nat. Sci. Herb.); Wawa, 5 July, 1908, *Pennell 15,* and 9 June, 1896, *Bartram* (Phil. Acad. Nat. Sci. Herb.); Chester Heights, 23 June, 1907, *Pennell* (Phil. Acad. Nat. Sci. Herb.); Mineral Hill, 9 June, 1911, and 6 Sept., 1908, *Pennell 2719, 610* (Phil. Acad. Nat. Sci. Herb.); Fawkes Run, 30 May, 1909, and 10 June, 1911, *Pennell 1365, 2742* (Phil. Acad. Nat. Sci. Herb.); Phoenixville, Chester Co., coll. of 1865, *Martindale* (Phil. Acad. Nat. Sci. Herb.); Sugartown Barrens, 22 July, 1908, *Pennell 293,* and serpentine ridge, northwest of Sugartown, 30 May, 1909, *Pennell 1379* (Phil. Acad. Nat. Sci. Herb.); serpentine ridge, Willistown, 28 May, 1904, *Painter 673* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Willistown barrens, 24 May, 1908, *Williamson* (Phil. Acad. Nat. Sci. Herb.); serpentine ridge, Chester Co., June, 1882, *Windle* (U. S. Nat. Herb.); Westtown, 22 June, 1895, *Crawford* (Phil. Acad. Nat. Sci. Herb.); Fern Hill, 7 June, 1909, *Long* (Phil. Acad. Nat. Sci. Herb.); West Chester, coll. of 1828, *Wm. Darlington* (Phil. Acad. Nat. Sci. Herb.); West Chester, without date, *David Townsend,* and 29 May, 1909, *Pennell 1344* (Phil. Acad. Nat. Sci. Herb.); Sconnelltown, 29 July, 1908, *Pennell 343* (Phil. Acad. Nat. Sci. Herb.); Nottingham Barrens, 22 May, 1912, *Pennell & Long 3715, 7538* (Phil. Acad. Nat. Sci. Herb.); Cedar Barrens, Chester Co., 30 May, 1909, and 10 June, 1911, *Pennell 1395, 2760* (Phil. Acad. Nat. Sci. Herb.); high above Muddy Run, 5 July, 1904, *Crawford* (Phil.

Acad. Nat. Sci. Herb.); Pequea, June, 1893, *Eby* (Mo. Bot. Gard. Herb.); near Mt. Hope, 5 June, 1900, *Heller* (Gray Herb. and U. S. Nat. Herb.); Conewago, 28 May, 1889, *Heller* (Gray Herb.); in wet meadow, Rock Hill, 31 May, 1903, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); Rawlinsville, coll. of 1884, *ex Herb. Galen* (Gray Herb.); Fulton, June, 1906, *Carter* (Phil. Acad. Nat. Sci. Herb.); near Pleasant Grove, in serpentine barrens, 5 June, 1901, *Heller* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); dry ground, near Round Top, Gettysburg, Adams Co., 24 June, 1894, *MacElwee* (Phil. Acad. Nat. Sci. Herb.); York Co., 3 June, 1895, *Glatfelter* (Mo. Bot. Gard. Herb.); Ohiopyle, Fayette Co., 3–8 June, 1905, *Brown, Crawford & Van Pelt* (Phil. Acad. Nat. Sci. Herb.).

Delaware: dry serpentine barrens, near Centerville, 15 June, 1866, and 10 July, 1868, *Commons* (Phil. Acad. Nat. Sci. Herb.); on serpentine, south of Mount Cuba, 18 June, 1914, *Pennell 1510* (Phil. Acad. Nat. Sci. Herb.); near Cooch's Mill, 29 May, 1896, *Commons* (Phil. Acad. Nat. Sci. Herb. 543180), in part.

Maryland: Rockville, 30 May, 1905, *Painter 1366* (Mo. Bot. Gard. Herb.); Brooklyn, 30 May, 1899, *Thurston* (U. S. Nat. Herb.); Laurel, 23 May, 1897, *Knowlton* (U. S. Nat. Herb.); College Park, 28 May, 1900, *Stewart* (Mo. Bot. Gard. Herb.); Mountain Lake Park, Garrett Co., *Shreve 560* (U. S. Nat. Herb.).

Virginia: on rocks in moss, Great Falls, June, 1903, *Painter 357* (U. S. Nat. Herb.).

Michigan: "L. Superior, Pic to Sault", *Loring* (Gray Herb.); Macinaw City, 12 Aug., 1890, *Wheeler* (Gray Herb.); Thunder Bay Island, Alpena Co., 18 July, 1895, *Wheeler* (Gray Herb.); North Point, Alpena Co., 3 July, 1895, *Wheeler* (U. S. Nat. Herb.); dry woods near Hillman, Montmorency Co., 7 July, 1895, *Wheeler* (U. S. Nat. Herb.); Clarkston, 30 June, 1888, *Hicks* (U. S. Nat. Herb.); marl beds on Parkdale Farm, colls. of 1912, 1913, and 1914, *Farwell 2652, 2653, 3491, 3659, 3660* (Mo. Bot. Gard. Herb.).

Ohio: Marblehead Peninsula, 20 May, 1895, *Moseley* (U. S. Nat. Herb.).

Indiana: Mineral Springs, 14 June, 1911, *Nieuwland 2657* (Mo. Bot. Gard. Herb.); moist sands and swales, Pine, 12 June, 1897, *Umbach* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); sandy soil, Edgmoor, Lake Co., 13 June, 1891, *Moffatt 451* (Field Mus. Herb.); prairie, Roby, 18 June, 1910, *Lansing 2784* (U. S. Nat. Herb.).

Minnesota: Center City, June, 1892, *Taylor* (U. S. Nat. Herb.); damp places near Minneapolis, June, 1892, *Burglehaus* (Mo. Bot. Gard. Herb.); without definite locality, July, 1899, *Woods* (U. S. Nat. Herb.); without locality, June, 1849, *Dr. Sykes* (Mo. Bot. Gard. Herb.).

Wisconsin: "N. W. America", *Long* (Mo. Bot. Gard. Herb.).

Illinois: in moist sandy soil near Lake Michigan, Beach, 16 June, 1907, *Greenman 1987, 2015* (Mo. Bot. Gard. Herb.); rich meadow, Beverly Hills, 6 June, 1903, *Chase 2066* (U. S. Nat. Herb.); Morgan Park, 27 May, 1907, *Dixon & Gage 710* (U. S. Nat. Herb.).

Missouri: near Mark Twain's Cave, Ralls Co., 5 May, 1914, *Rev. John Davis 2333* (Mo. Bot. Gard. Herb.).

Var. **firmifolius** (Greenm.) comb. nov.

S. Balsamitae var. *firmifolius* Greenm. Rhodora **7**:244. 1905.

Stems .5 to 2.5 dm. high, simple or branched, more or less tufted; lower leaves mostly short-petiolate, subrotund, oblong-elliptic to oblong-oblanceolate, .5 to 4 cm. long, 5 to 20 mm. broad, crenate-dentate to sublyrately pinnatifid, at first as well as the stem somewhat tomentulose, later more or less glabrate and thickish or firm in texture; upper stem-leaves sessile and pinnatisect to linear and bracteiform.

Distribution: in limestone detritus, crest of Les Murailles, Percé, Gaspé Co., 17 Aug., 1904, *Collins, Fernald & Pease* (Gray Herb.), TYPE; limestone detritus, Mont Rouge, Percé, Gaspé Co., 23 July, 1905, *Collins & Fernald* (Gray Herb.); limestone detritus, Cap Barré, Percé, Gaspé Co., 23 July,

1905, *Collins & Fernald 147* (Gray Herb. and U. S. Nat. Herb.); limestone shingle near summit of Baldé, Bonaventure Co., 5, 6, and 8 Aug., 1904, *Collins, Fernald & Pease* (Gray Herb.); wet red sandstone bluffs and steep slopes, between Baldé and the Baie des Chaleurs, Bonaventure River, 5, 6, and 8 Aug., 1904, *Collins, Fernald & Pease* (Gray Herb.); ledgy banks of the Restigouche River, Metapedia, 19 July, 1904, *Collins & Fernald* (Gray Herb.). The last three specimens cited are transitional forms between the variety and the species.

70. S. flavovirens Rydb. Bull. Torr. Bot. Club **27**:181, *pl. 5, fig. 4.* 1900, mainly; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

S. fulgens Rydb. Bull. Torr. Bot. Club **27**:177, *pl. 6, fig. 13.* 1900, not. Nichols.

S. Rydbergii Nels. in Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909.

S. Balsamitae Rydb. Mem. N. Y. Bot. Gard. **1**:446. 1900, mainly, not Muhl.; Nelson in Coulter & Nelson, Manual Cent. Rocky Mountains 583. 1909, not Muhl.

S. flavulus Rydb. Fl. Colo. 397. 1906, in part, not Greene.

An herbaceous perennial, pale or yellowish green in the dried state, glabrous or slightly white-tomentulose along the margins of the petioles near their base and in the axils of the leaves; stems erect, 2 to 5 dm. high; lower leaves petiolate, oblanceolate to oval, 1 to 6 cm. long, .5 to 2 cm. broad, gradually narrowed into the petiole to abruptly constricted at the base, crenate to coarsely and unequally dentate, obtuse or rounded at the apex, glabrous on both surfaces; stem-leaves petiolate and more or less lyrate to sessile and pinnatisect; inflorescence a terminal few-headed corymbose cyme; heads 7 to 9 mm. high, radiate; involucre campanulate, calyculate; bracts of the involucre 13 to 21, linear-lanceolate, 5 to 7 mm. long, pale or yellowish green and glabrous except at the brownish penicillate tip, becoming thickish in texture; ray-flowers 10 to 12, rays bright yellow; disk-flowers numerous; achenes glabrous or slightly hirtellous along the angles.

Distribution: British Columbia, south to Colorado and Idaho.

Specimens examined:

British Columbia: Field, 12 July, 1904, *Farr* (Univ. Penn. Herb.); Ottertail Drive, near Field, 15 July, 1905, *Farr 817, 818* (Univ. Penn. Herb.); border of an alkali marsh, Similkameen River, 10 June, 1905, *Macoun 69356* (Gray Herb.); Lower Fraser River, N. Lat. 49°, Oregon Boundary Commission, coll. of 1859, *Dr. Lyall* (Gray Herb.).

Montana: Big Fork, Aug., 1908, *Mrs. Joseph Clemens* (Field Mus. Herb. and Mo. Bot. Gard. Herb.).

Yellowstone National Park: Mammoth Hot Springs, 5 July, 1899, *Blankenship* (Gray Herb.); about willow clumps on river bottom, Snake River, 12 Aug., 1899, *A. & E. Nelson 6402* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Fitzgerald's Ranch, near Gardiner Mountain, 3 July, 1902, *Mearns 1493* (U. S. Nat. Herb. and Field Mus. Herb.).

Wyoming: low ground, Adam's Ranch, Jackson's Hole, 15 July, 1901, *Merrill & Wilcox 967* (U. S. Nat. Herb.); sandy soil, Blue Lakes on Wind River, 6 July, 1881–82, *Forwood* (U. S. Nat. Herb.); Wind River, Aug., 1894, *A. Nelson 760* (Gray Herb. and U. S. Nat. Herb.); Horse Creek, coll. of 1893, *A. Nelson 100* (U. S. Nat. Herb.); Green River, 26 July, 1894, *A. Nelson 1036* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Dale Creek, near Sherman, 29 July, 1884, *Letterman* (Mo. Bot. Gard. Herb.); Evanston, 10 July, 1897, *Williams* (U. S. Nat. Herb.); La Barge, Uinta Co., 18 July, 1894, *Stevenson 201* (U. S. Nat. Herb.); Myer's ranch, Bear River, south of Evanston, alt. 2285–2440 m., 26 July, 1902, *Pammel & Blackwood 4044* (Mo. Bot. Gard. Herb.).

Colorado: N. Lat. 39–41°, coll. of 1862, *Hall & Harbour 332*, in part (Phil. Acad. Nat. Sci. Herb. and Mo. Bot. Gard. Herb.), and *115*, in part (Gray Herb.); Colorado Springs, May, 1878, *Jones* (U. S. Nat. Herb. 223024, in part).

Idaho: open grassy stream lands, Mackay, Custer Co., 1 Aug., 1911, *Nelson & Macbride 1500* (Mo. Bot. Gard. Herb.); Arco, 19 June, 1893, *E. Palmer 193* (U. S. Nat. Herb.).

Var. **thomsoniensis** (Greenm.) comb. nov.

S. Balsamitae var. *thomsoniensis* Greenm. Ottawa Nat. **25**:116. 1911.

S. Balsamitae Greenm. Ottawa Nat. **25**:116. 1911, not Muhl.

Stems 1.2 to 4.5 dm. high, at first floccose-tomentulose later more or less glabrate; lower leaves oblong-oblanceolate, the blade 1 to 7 cm. long, 5 to 12 mm. broad, rounded or obtuse at the apex, crenate to serrate, gradually narrowed at the base into the petiole, at first tomentulose, particularly on the under surface, later more or less glabrate; inflorescence and base of the involucre often slightly tomentulose.

Distribution: Alaska to British Columbia and Montana.

Specimens examined:

Alaska: on gravel flood-plain of the Kuskokwim River, 19 July, 1902, *Brooks & Prindle* (U. S. Nat. Herb.).

British Columbia: Bonaparte River, 18 June, 1889, *Macoun* (U. S. Nat. Herb. 219791, in part); South Thompson River at Kamloops, 10 July, 1906, *E. Wilson 686, 672* (Mo. Bot. Gard. Herb. and Geol. Surv. Canada Herb. 81261); Lake Osoyoos, 31 May, 1905, *Macoun 69357* (Gray Herb.).

Montana: Big Fork, Flathead Co., 14 June, 1904, *W. W. Jones* (Mo. Bot. Gard. Herb.).

Washington: Fort Okanogan, U. S. Exploring Expedition, *Wilkes 971* (U. S. Nat. Herb. 48747).

71. S. multnomensis Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Ottawa Nat. **25**:115. 1911.

An herbaceous perennial, glabrous or slightly floccose-tomentulose in the axils of the leaves, on the margins of the petioles, and in the inflorescence; stems solitary or cespitose, erect or somewhat flexuous, 3 to 7 dm. high; lower leaves oblong-oblanceolate including the petiole 4 to 15 cm. long, .8 to 2 cm. broad, obtuse or rounded at the apex, crenate-dentate to more or less lyrately lobed with remote lobes and deep rounded sinuses, narrowed at the base into a slender petiole usually exceeding the blade; upper stem-leaves sessile and pinnatisect to much reduced entire bracts; inflorescence a ter-

minal few to many-headed corymbose cyme; heads 10 to 13 mm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre about 21, linear-lanceolate, 7 to 10 mm. long, usually pale green, glabrous or slightly floccose-tomentulose; ray-flowers 10 to 13, rays yellow; disk-flowers numerous, about 60; achenes glabrous.

Distribution: Mackenzie south to Saskatchewan, west to eastern Washington.

Specimens examined:

Mackenzie: Fort Smith, 4 Aug., 1901, *E. A. & A. E. Preble 172* (U. S. Nat. Herb.).

Saskatchewan: without definite locality, Palliser's British N. Am. Expl. Expedition, 1858, *E. Bourgeau* (Gray Herb.); Cypress Hills, province of Assiniboia, 24 June, 1894, *Macoun 5070* (Gray Herb. and U. S. Nat. Herb.).

Alberta: dry or rocky soil, Bow Valley, five miles west of Calgary, 14 June, 1913, *Moodie* (U. S. Nat. Herb.).

British Columbia: Kicking Horse Valley, vicinity of Field, alt. 1220 m., 20 June–25 July, 1906, *Brown 486, 487* (Phil. Acad. Nat. Sci. Herb.); Glacier, 30 July, 1901, *Williamson* (C. S. Williamson Herb.); cleared land at Howser Lake, alt. 610 m., 15 June, 1905, *Shaw 722* (U. S. Nat. Herb.); Trail, 10 June, 1902, *Macoun 64989* (Gray Herb.); Trail, 18 June, 1902, *Macoun 64992* (Gray Herb. and Mo. Bot. Gard. Herb.); rocky valley of Fraser River, above Yale, 22 July, 1880, *G. Engelmann* (Mo. Bot. Gard. Herb.).

Idaho: wet soil, Kootenai Co., alt. 900 m., July, 1900, *Leiberg* (Mo. Bot. Gard. Herb.).

Washington: Coleville Reservation, June, 1902, *Griffiths & Cotton 366* (U. S. Nat. Herb.).

Oregon: sandy flats, Cascades, 25 May, 1869, *Kellogg & Harford 537* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Multnomah Co., June, 1877, *T. J. Howell 221* (Gray Herb.), TYPE.

72. S. laetiflorus Greene, Pittonia **3**:88. 1896.

S. aureus var. *borealis* Eaton, in Bot. King's Exp. 190. 1871, not Torr. & Gray.

S. cymbalarioides var. *diversilobus* Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

An herbaceous perennial, glabrous, or in the early stages slightly white-flocculose-tomentulose and soon glabrate; stems 2 to 5 dm. high, simple or branched from the base; lower leaves petiolate, broadly ovate, elliptic-oblong to obovate, 1 to 6.5 cm. long, .5 to 4.5 cm. broad, entire to crenate-dentate, cuneate at the base and more or less decurrent on the petiole, thick and firm in texture; petioles 1.5 to 14 cm. long; stem-leaves sublyrate or irregularly pinnate-lobed with remote lobes, the uppermost sessile, semi-amplexicaul, often much reduced; inflorescence a few to many-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre (13–)21, linear-lanceolate, 5 to 8 mm. long, thickish, glabrous or at first slightly tomentulose and glabrate; ray-flowers about 13, rays pale yellow; disk-flowers numerous; achenes glabrous.

Distribution: Oregon, California, Idaho, and Nevada.

Specimens examined.

Oregon: moist meadows, Powder River Valley, alt. 1065 m., June–July, 1897, *Cusick 1617* (Gray Herb., U. S. Nat. Herb., Greene Herb., and Mo. Bot. Gard. Herb.); Otis Creek, alt. 1100 m., 19 June, 1896, *Leiberg 2324* (U. S. Nat. Herb.); near Devine ranch, alt. 1290 m., 27 June, 1896, *Leiberg 2411* (U. S. Nat. Herb.); Harney Valley, 29 May, 1885, *Th. Howell* (Gray Herb. and U. S. Nat. Herb.); near Silver Lake, alt. 1470 m., 20 Aug., 1894, *Leiberg 764* (Mo. Bot. Gard. Herb.), and *764a, 764b* (U. S. Nat. Herb.); Annie Creek, 8 Aug., 1897, *Mrs. R. M. Austin 1618* (U. S. Nat. Herb.).

California: near Boca, 26 July, 1895, *E. L. Greene* (Greene Herb.), TYPE; Gazelle, Siskiyou Co., 20 June, 1905, *Heller 8076* (U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Purdy, Sierra Co., 1 July, 1907, *Heller & Kennedy 8665* (U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Summit, *Bolander & Kellogg* (Gray Herb.); Sierraville, alt. 1525 m., *Hall & Babcock 4473* (Gray Herb.); Little Truckee River, alt. 2740 m., July, 1903,

Hall & Babcock 4526 (Gray Herb.); Sierra Nevada Mountains, coll. of 1875, *Lemmon* (U. S. Nat. Herb. 48715).

Nevada: Hunter Creek Cañon, Washoe Co., alt. 1830 m., 18 June, 1912, *Heller 10479* (U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.); Lemmon Valley, Washoe Co., alt. 1830 m., 8 July, 1913, *Kennedy 2066* (Mo. Bot. Gard. Herb.); Carson City, alt. 1525 m., 4 June, 1897, *M. E. Jones* (U. S. Nat. Herb. 359610); near Carson City, coll. of 1865, *Anderson* (Gray Herb.); Ruby Valley, alt. 1830 m., U. S. Geol. Expl. of the 40th Parallel, July, 1868, *Watson 670* (Gray Herb. and U. S. Nat. Herb.); without definite locality, coll. of 1872, *Lieut. Wheeler* (U. S. Nat. Herb. 48772).

Idaho: in patches on open slopes, Deer Creek, Owyhee Co., 1 July, 1912, *Nelson & Macbride 1850* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); moist sunny slopes, Three Creek, Owyhee Co., 1 July, 1912, *Nelson & Macbride 2247* (U. S. Nat. Herb.).

73. S. Suksdorfii Greenm. Bot. Gaz. **53**:511. 1912; Piper & Beattie, Fl. Northwest Coast 389. 1915.

S. Adamsi Howell, Fl. Northwest Am. **1**:379. 1900, not *S. Adamsii* Cheesem. Trans. N. Z. Inst. **28**:536. 1896; Piper, Contr. U. S. Nat. Herb. **11**:598. 1906.

An herbaceous perennial, slightly white-floccose-tomentulose in the leaf-axils and on the margins of the petioles near their base, otherwise glabrous; stems one to several from a rather stout rootstock, 1 to 2.5 dm. high; lower leaves petiolate, broadly ovate, 1 to 4 cm. long, 1 to 2.5 cm. broad, subtruncate to abruptly contracted to a cuneate base, crenate-dentate from base to apex, glabrous on both surfaces; petioles 1 to 5 cm. long; stem-leaves petiolate and sublyrate to sessile and more or less incised-dentate; inflorescence a few to several-headed corymbose cyme; heads 8 to 10 mm. high, radiate; ray-flowers 8 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: Washington to Nevada and California.

Specimens examined:

Washington: Mt. Adams (Paddo), alt. about 2155 m., 9 Aug., 1882, *Suksdorf 73* (Gray Herb., Geol. Surv. Canada

Herb., and Field Mus. Herb.); east of Mt. Adams (Paddo), Aug., 1892, *Henderson 2309* (Gray Herb.); Mt. Adams, alt. 1980 m., 25 July, 1899, *Flett* (U. S. Nat. Herb. 415519 in part); Indian Henry Park, Sept., 1909, *Tarleton 62* (Field Mus. Herb.).

Oregon: bases of granitic cliffs, source of the Imnaha, Wallowa Mountains, alt. 2690 m., Aug., 1906, *Cusick 3131* (U. S. Nat. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.).

Nevada: Mt. Rose, alt. 2940 m., 29 July, 1909, *Heller 9896* (U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., Field Mus. Herb., and Mo. Bot. Gard. Herb.).

California: wet mountain slopes at Lady Bug Peak, alt. 2440 m., 12 Aug., 1900, *Leiberg 5318* (U. S. Nat. Herb.).

74. S. rubricaulis Greene, Pittonia **3**:89. 1896.

S. aureus var. *croceus* Eaton in Bot. King's Exp. 190. 1871, not Gray, Proc. Acad. Phil. **15**:68. 1863.

S. Jonesii Rydb. Bull. Torr. Bot. Club **27**:179, *pl. 5, fig. 5.* 1900.

S. cymbalarioides Nelson in Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909, as to *S. Jonesii* in synonymy.

An herbaceous perennial, glabrous or nearly so; stems erect, 3 to 4 dm. high; lower leaves petiolate, broadly ovate to obovate, 1 to 5 cm. long, 1 to 3 cm. broad, rather coarsely dentate, abruptly cuneate at the base, glabrous on both surfaces; petioles 1 to 7 cm. long, often purplish; stem-leaves petiolate and sublyrate to sessile and pinnatifid; inflorescence a terminal few to several-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre 13 to 21, linear-lanceolate, 5 to 7 mm. long, acute, glabrous, thickish, and in the later stages drying dark brown or blackish; ray-flowers 8 to 10, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: mountains of Utah, Wyoming, and Nevada.

Specimens examined:

Nevada: foothills of Clover Mountains, coll. of 1893, *E. L. Greene* (Greene Herb.), TYPE; Clover Mountains near Deeth, Elko Co., alt. 2000 m., 22 July, 1908, *Heller 9091* (Phil. Acad. Nat. Sci. Herb.).

Utah: Alta Wasatch Mountains, alt. 3350 m., 31 July, 1879, *M. E. Jones 1125* (Torrey Herb. and Field Mus. Herb.), type of *S. Jonesii;* Wasatch Mountains, alt. 1525 m., May, 1869, *Watson 671* (Gray Herb.); Salt Lake City, alt. 1300 m., 15 July, 1880, *M. E. Jones 1996* (U. S. Nat. Herb.); Red Butte Cañon, Salt Lake Co., 12 July, 1906, *Garrett 1854, 1854a* (Field Mus. Herb.).

Yellowstone National Park: Electric Peak, alt. 2590 m., 26 July, 1902, *Sheldon 179* (U. S. Nat. Herb.); without definite locality, Aug., 1902, *Mearns 2671, 2719* (U. S. Nat. Herb.).

Var. **aphanactis** Greenm. var. nov.

Stem somewhat flexuous, at the base as well as the petioles more or less purplish; lower leaves rather coarsely and unequally dentate; heads about 1 cm. high, slightly nodding, discoid.

Distribution: Utah.

Specimen examined:

Utah: dry cañon, Logan, Cache Co., alt. 1525 m., 23 June, 1910, *C. P. Smith 2208* (Field Mus. Herb., photograph in Mo. Bot. Gard. Herb.), type.

75. S. cymbalarioides Nutt. Trans. Am. Phil. Soc. N. S. **7**:412. 1841; Rydb. Mem. N. Y. Bot. Gard. **1**:446. 1900, in part; Bull. Torr. Bot. Club **27**:178. 1900, mainly; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Piper, Contr. U. S. Nat. Herb. **11**:598. 1906.

S. aureus var. *borealis* Torr. & Gray, Fl. N. Am. **2**:442. 1843, in part, i. e., *S. cymbalarioides* in synonymy; Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886, in part.

S. aureus var. *obovatus* Eaton, in Bot. King's Exp. 190. 1871, not Torr. & Gray.

S. subcuneatus Rydb. Bull. Torr. Bot. Club **27**:179, *pl. 5. fig. 6.* 1900; Fl. Colo. 397. 1906.

An herbaceous perennial, glabrous except for a white-floccose tomentum in the axils of the leaves and on the base of the petioles; stems solitary or several from a common base, 1 to 3 dm. high; lower leaves petiolate, the blade broadly ovate, obovate to somewhat spatulate, 1 to 6 cm.

long, .5 to 3 cm. broad, entire or dentate towards the apex, glabrous on both surfaces, thick and firm in texture; petioles 1 to 8 cm. long; stem-leaves petiolate or sessile, incised-serrate to entire, the uppermost much reduced; inflorescence a few to several-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, sparingly calyculate, glabrous or rarely slightly tomentulose at the base; bracts of the involucre linear-lanceolate, 5 to 8 mm. long, thickish, in age drying dark brown or blackish and appearing somewhat glutinous; ray-flowers 8 to 12, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: Alberta and British Columbia, south to New Mexico and Nevada.

Specimens examined.

British America: Explorations in subarctic America, coll. of 1862, *Onion, Kennicott & Hardisty* (U. S. Nat. Herb.).

Montana: Duck Lake, 23 June, 1901, *Weller* (U. S. Nat. Herb.); hills and plains, Midvale, 17 and 24 June, 1903, *Umbach 78, 154* (U. S. Nat. Herb.); Little Belt Pass, alt. 2130 m., 10 Aug., 1896, *Flodman 910* (U. S. Nat. Herb.); near Red Lodge, 28 July, 1893, *Rose 79* (U. S. Nat. Herb.); Jack Creek Cañon, 15 July, 1897, alt. 2135 m., *Rydberg & Bessey 5265* (U. S. Nat. Herb.).

Yellowstone National Park: Swan Lake Flat, 30 July, 1902, *Sheldon 266* (U. S. Nat. Herb.); in open aspen groves, Yellowstone River, near Junction Butte, 10 July, 1899, *A. & E. Nelson 5823* (U. S. Nat. Herb., Gray Herb., and Mo. Bot. Gard. Herb.).

Wyoming: mountain sides, head of Middle Fork on Powder River, Big Horn Co., 19 July, 1901, *Goodding 302* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); grassy hillside, Ten Sleep Lakes, Big Horn Co., 30 July, 1901, *Goodding 414* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); northwestern Wyoming, 4 Sept., 1893, *Rose 683* (U. S. Nat. Herb.); flats near Holm Lodge, 28 June, 1911, *Reynolds 5* (Field Mus. Herb.); river bottoms, En-

campment, alt. 2195 m., 20 June, 1901, *Tweedy 4130* (U. S. Nat. Herb.).

Colorado: Grizzly Creek, 19 July, 1896, alt. 2590 m., *Baker* (Mo. Bot. Gard. Herb.), CO-TYPE of *S. subcuneatus.*

New Mexico: Baldy, 14 Aug., 1910, *Wooton* (U. S. Nat. Herb.).

Idaho: moranic ridge, south of Petit Lake, alt. 2195–2285 m., 14 Aug., 1895, *Evermann 330* (U. S. Nat. Herb.); Beaver Cañon, 28 June, 1895, *Shear 3028* (U. S. Nat. Herb.); timbered slopes, Mackay (Bear Cañon), Custer Co., alt. 2435 m., 31 July, 1911, *Nelson & Macbride 1510* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); four miles south of Ketchum, 23 July, 1895, *Henderson 3234* (U. S. Nat. Herb.); Henry's Lake and Mt. Chauvet, alt. 3050 m., 29 July, 1897, *Rydberg & Bessey 5267* (U. S. Nat. Herb. and Kew Herb.).

Utah: Wasatch Mountains, alt. 2135 m., June, 1869, *Watson 669* (Gray Herb.); Fish Lake, alt. 3050 m., 2 Aug., 1894, *Jones 57170* (U. S. Nat. Herb. 235767); Thousand Lake Mountain, alt. 3140 m., U. S. Geol. and Geog. Survey of the Territories, 13 July, 1875, *Ward 366* (U. S. Nat. Herb. 143111 in part).

Nevada: sagebrush flats, Mountain City, alt. 1830 m., 13 Aug., 1912, *Nelson & Macbride 2201* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); meadow, vicinity of Gold Creek, 6 Aug., 1913, *Hitchcock 1054* (U. S. Nat. Herb.).

Washington: south slope of Mt. Chapa, alt. 1220 m., Aug., 1897, *Elmer 592* (Mo. Bot. Gard. Herb. and Berlin Herb.); moist slopes, head of Prince Creek, alt. 1585 m., 2 Sept., 1897, *Gorman 809* (U. S. Nat. Herb.); coniferous woods, head of Twenty-five-mile Creek, alt. 1490 m., 10 Aug., 1897, *Gorman 810* (U. S. Nat. Herb.); slopes of Mt. Stuart, alt. 1065–1830 m., 24 July, 1893, *Sandberg & Leiberg 553* (Field Mus. Herb., Greene Herb., and Mo. Bot. Gard. Herb.), CO-TYPE of *S. fraternus;* Mt. Stuart, Kittitas Co., July, 1898, *Elmer 1384* (Mo. Bot. Gard. Herb.); Yakima Region, Northern Transcontinental Survey, coll. of 1883, *Brandegee 916* (Gray Herb.).

Oregon: "Columbia woods," *Nuttall* (Phil. Acad. Nat. Sci. Herb.); "R. Mts.," *Nuttall* (Gray Herb.); river bottoms, Union Co., coll. of 1881, *Cusick 928* (Gray Herb.); Cascade Mountains, alt. 1525 m., Oregon Boundary Commission, coll. of 1860, *Lyall* (Gray Herb.).

Var. **borealis** (T. & G.) Greenm. comb. nov.

S. aureus var. *borealis* Torr. & Gray, Fl. N. Am. **2**:442. 1843, excluding *S. cymbalarioides* Nutt.; Gray, Syn. Fl. N. Am. **1**²:391. 1884, and ed. 2, 1886, in small part; Macoun, Cat. Canadian Pl. 265. 1884, in part; Porter & Coulter, Syn. Fl. Colo. 81. 1874, in part; Coulter, Manual Rocky Mountain Region 211. 1885, in part.

S. aureus Hook. Fl. Bor. Am. **1**:333. 1834, in part, not L.

S. elongatus Howell, Fl. Northwest Am. **1**:379. 1900, as to *S. aureus* var. *borealis* in synonymy, not Pursh.

Stems slender, nearly naked above; lower leaves subspatulate to oblanceolate, including the petiole 1.5 to 6 cm. long, less than 1 cm. broad; in all other characters like the species into which it passes through several intermediate forms.

Distribution: Arctic America to Wyoming and Utah.

Specimens examined:

"Arctic America": *ex Herb. Hooker* (Gray Herb.).

Alberta: Fort Chipewyan, Athabasca, 5 June, 1903, *Preble & Cary 3* (U. S. Nat. Herb.); Peace River Landing, 13 June, 1903, *Macoun 61239* (Gray Herb.).

British Columbia: Skagit Valley, alt. 1220 m., 10 July, 1905, *Macoun 69362* (Gray Herb.).

Montana: Monida, 26 June, 1900, *Blankenship* (Gray Herb.).

Wyoming: head of Big Goose Creek, Big Horn Mountains, 15–24 July, 1893, *Tweedy 65* (U. S. Nat. Herb.).

Utah: Thousand Lake Mountain, alt. 3170 m., U. S. Geol. and Geog. Survey of the Territories, 13 July, 1875, *Ward 366* (Gray Herb. and U. S. Nat. Herb. 143111 in part).

Var. **streptanthifolius** (Greene) Greenm. comb. nov.

S. streptanthifolius Greene, Erythea **3**:23. 1895; Howell, Fl. Northwest Am. **1**:375. 1900.

Lower leaves suborbicular, obovate or oblong-obovate, somewhat glaucous.

Distribution: southeastern Idaho and northwestern Wyoming.

Specimens examined:

Idaho: Beaver Cañon, 1 Aug., 1889, *E. L. Greene* (Greene Herb.), TYPE; Beaver Cañon, 29 July, 1889, *E. L. Greene* (U. S. Nat. Herb.); northwestern Wyoming, 22 Aug., 1893, *Rose 243* (U. S. Nat. Herb.).

76. S. acutidens Rydb. Bull. Torr. Bot. Club **27**:180, *pl. 5, fig. 2.* 1900; Greenm. Monogr. Senecio, I. Teil, 23. 1901, and in Engl. Bot. Jahrb. **32**:19. 1902.

S. cymbalarioides Coulter & Nelson, Manual Cent. Rocky Mountains 582. 1909, in part, as to *S. acutidens* in synonymy; Wooton & Standley, Contr. U. S. Nat. Herb. **19**:747. 1915, as to specimen cited.

An herbaceous perennial, glabrous or slightly floccose-tomentulose in the early stages and soon glabrate except in the axils of the leaves; stems 1.5 to 2.5 dm. high, erect, more or less tufted, simple or branched; lower leaves obovate to oblong-oblanceolate, including the petiole 3 to 12 cm. long, .5 to 1.5 cm. broad, dentate towards the apex, entire towards the base and gradually narrowed into the petiole, thick and firm in texture, often bluish green and somewhat glaucous; stem-leaves oblanceolate and rather sparingly dentate to lance-attenuate and entire; inflorescence a terminal few to several-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre sparingly calyculate; ray-flowers 8 to 10, rays yellow; disk-flowers numerous; achenes glabrous or rarely slightly hirtellous along the angles.

Distribution: Wyoming to New Mexico.

Specimens examined:

Wyoming: Union Pass, Wind River Range, 10 Aug., 1894, *A. Nelson 858* (N. Y. Bot. Gard. Herb., Gray Herb., U. S.

Nat. Herb., Greene Herb., and Mo. Bot. Gard Herb.), TYPE; near Fort Bridger, coll. of 1873, *Pruddon* (Gray Herb.).

Colorado: Denver, Lieut. Wheeler's Expedition, 1873, *Wolf & Rothrock 558* (Gray Herb. and U. S. Nat. Herb.); Union Creek Pass, Lieut. Wheeler's Expedition, 1873, *Wolf & Rothrock 586* (U. S. Nat. Herb. and Gray Herb.).

New Mexico: Costilla Valley, alt. 3050 m., 5 Sept., 1913, *Wooton* (U. S. Nat. Herb.).

77. S. tridenticulatus Rydb. Bull. Torr. Bot. Club **27**:175. 1900; Fl. Colo. 396. 1906.

S. compactus (Gray) Rydb. Mem. Torr. Bot. Club **5**:342. 1894, not Kirk in Trans. N. Z. Inst. **12**:395. 1880; Heller, Cat. N. Am. Pl. 146. 1898, and ed. 2, 229. 1900; Britton & Brown, Ill. Fl. **3**:480, *fig. 4045*. 1898; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Britton, Manual 1028. 1901, and ed. 2, 1905.

S. aureus var. *compactus* Gray, Syn. Fl. N. Am. **1**^{2}:391. 1884, and ed. 2, 1886.

S. aureus var. *borealis* Gray, Pl. Wright., pt. 1, p.125. 1852, not Torr. & Gray.

S. oblanceolatus Rydb. Bull. Torr. Bot. Club **27**:175, *pl. 5, fig. 9*. 1900; Fl. Colo. 396. 1906; Wooton & Standley, Contr. U. S. Nat. Herb. **19**:747. 1915.

S. densus Greene, Pittonia **4**:226. 1900; Britton & Brown, Ill. Fl. **3**:546, *fig. 4631*. 1913.

S. condensatus Rydb. Fl. Colo. 396. 1906, not Greene.

S. mutabilis Nelson in Coulter & Nelson, Manual Cent. Rocky Mountains 583. 1909, mainly, not Greene.

S. manitobensis Greenm. Ottawa Nat. **25**:117. 1911, mainly.

S. suavis Lunell, Am. Mid. Nat. **2**:125. 1911.

S. Metcalfei Greene, Contr. U. S. Nat. Herb. **16**:193. 1913; Wooton & Standley, Contr. U. S. Nat. Herb. **19**:748. 1915.

S. remifolius Wooton & Standley, Contr. U. S. Nat. Herb. **16**:194. 1913.

An herbaceous perennial, glabrous or somewhat white-floccose-tomentulose and later glabrate except at the base and in the leaf-axils; stems one to several, frequently rather

densely tufted, 1 to 3 dm. high; lower leaves oblanceolate, entire, dentate towards the apex only or even pinnatisect, gradually narrowed at the base into a slender petiole, thick and firm in texture, including the petiole 2.5 to 10 cm. long, .5 to 1 cm. broad; upper stem-leaves becoming sessile and much reduced; inflorescence a terminal few to several-headed corymbose cyme; heads 8 to 10 mm. high, radiate; involucre campanulate, sparingly calyculate; bracts of the involucre 13 to 21, linear-lanceolate, 6 to 8 mm. long, glabrous; ray-flowers 10 to 12, rays yellow; disk-flowers numerous; achenes usually hirtellous on the ribs.

Distribution: Manitoba to Texas, and west to Nebraska, Colorado, and New Mexico.

Specimens examined:

Manitoba: sand hills at Brandon and Old Wives Lakes, 22 June, 1887, *Macoun 22* (Gray Herb.); on open prairie, south of Sewell, 12 June, 1876, *Macoun* (Geol. Surv. Canada Herb. 12232); gravelly or rocky places, Flat Creek, "N. W. T.," 20 June, 1880, *Macoun 103* (Geol. Surv. Canada Herb. 14796); Stewarts Lake Mountain, 21 June, 1875, *Macoun 14777* in part (Geol. Surv. Canada Herb.); north of Carberry, 14 June, 1906, *Macoun & Herriot* (Geol. Surv. Canada Herb. and Field Mus. Herb.); without definite locality, coll. of 1898, *E. S. Thompson* (Mo. Bot. Gard. Herb.).

North Dakota: on sand hills, McHenry Co., 13 July, 1899, *Lunell 24* (Gray Herb.).

South Dakota: Hot Springs, Fall River Co., 6 June, 1893, *Schenck* (Mo. Bot. Gard. Herb.).

Nebraska: Long Pine, 14 May and 4 June, 1893, *Rutter* (U. S. Nat. Herb.); sand hills on Middle Fork, Loup River, near Thedford, Thomas Co., 15 June, 1893, *Rydberg 1311* (Gray Herb. and U. S. Nat. Herb.); in dry sandy soil, Halsey, 1 and 2 June, 1903, *Mell & Knopf* (Mo. Bot. Gard. Herb.); Hershey, 20 May, 1903, *Mell 59* (U. S. Nat. Herb.); Franklin, coll. of 1893, *Labourne* (Mo. Bot. Gard. Herb.); Loup Fork, *Hayden* (Mo. Bot. Gard. Herb.).

Oklahoma: low places on prairie, near Camp, 12 May, 1913, *Stevens 420* (Mo. Bot. Gard. Herb.); without definite locality, *Stevens 489, 511* (G. W. Stevens Herb.).

Texas: on prairies, Amarillo, 19 May, 1902, *Reverchon 2523, 3330* (Mo. Bot. Gard. Herb.); prairies near Cañon City, June, 1901, *Eggert* (Mo. Bot. Gard. Herb.); Davis Mountains, 29 April, 1902, *Tracy & Earle 336* (Gray Herb., U. S. Nat. Herb., Greene Herb., and Mo. Bot. Gard. Herb.); "mountains beyond the Limpia," Expedition from western Texas to El Paso, May–October, 1849, *Wright 403* (Gray Herb.), TYPE.

Wyoming: open woods, Laramie Hills, Albany Co., 25 June, 1903, *A. Nelson 8962* (Mo. Bot. Gard. Herb.).

Colorado: near Greeley, June, 1908, *E. L. Johnston 461, 463, 466* (Mo. Bot. Gard. Herb.); dry plains, near Evans, colls. of 1907–1909, *E. L. Johnston 423, 423a, 424, 442, 443, 537, 538, 551, 552* (Mo. Bot. Gard. Herb.); Evans, 8 June, 1912, *E. L. Johnston 804* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); in river bottoms, Fort Lupton, 19 May, 1913, *E. L. Johnston 882, 883, 875* (U. S. Nat. Herb.); Clear Creek, Hayden's U. S. Geol. Survey, 20 May, 1873, *Coulter* (Phil. Acad. Nat. Sci. Herb.), in part; Lat. 39–41°, coll. of 1864, *Parry* (U. S. Nat. Herb. 349250); Lat. 39–41°, coll. of 1862, *Hall & Harbour 333* in part (Gray Herb. and Field Mus. Herb.); Denver, May, 1881, *B. H. Smith* (Phil. Acad. Nat. Sci. Herb.); Denver, May, 1889, *Eastwood* (U. S. Nat. Herb.); Denver, 8 June, 1891, *E. C. Smith* (Mo. Bot. Gard. Herb.); Denver, *Williamson* (C. S. Williamson Herb.); dry ground, Middle Creek, July, 1892, *Beardslee 60* (U. S. Nat. Herb.); near Breckenridge, Summit Co., alt. 2950 m., *Mackenzie 112* (Mo. Bot. Gard. Herb.); pasture land, Como, alt. 3050 m., 1 Aug., 1895, *Crandall & Cowen 280* (U. S. Nat. Herb.); Leadville, *H. A. Keller* (Phil. Acad. Nat. Sci. Herb.); Leadville, 8 July, 1886, *Trelease* (Mo. Bot. Gard. Herb.); wet sandy places, along Cottonwood Creek, Buena Vista, Chaffee Co., alt. 2425–2440 m., 4 July, 1892, *Sheldon 161, 479* (U. S. Nat. Herb.); open gravel bank, near railway station,

Limon, Lincoln Co., 13 June, 1912, *Churchill* (J. R. Churchill Herb.); Colorado Springs, May, 1879, *M. E. Jones* (U. S. Nat. Herb. 223024 in part); Colorado Springs, alt. 1830 m., 8 May, 1897, *A. A. & E. G. Heller 3508* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Colorado Springs, May, 1892, *Mulford* (Mo. Bot. Gard. Herb.); Colorado Springs, 2 Aug., 1891, collector not indicated (Mo. Bot. Gard. Herb.); Pike's Peak, 10 July, 1901, *Williamson* (C. S. Williamson Herb.); plains near Westcliffe, Custer Co., 25 July, 1887, *Demetrio* (Gray Herb.); Colorado Springs, 10 May, 1882, *Allen & Brewster* (U. S. Nat. Herb. and Gray Herb.); saline soil on the plains, 12 May, 1870, *Greene* (Gray Herb.); Veta Pass, Sangre de Cristo Range, alt. 2740–3350 m., 9–16 June, 1890, *Mr. & Mrs. G. H. Hicks 9* (Gray Herb.); Veta Pass, 15 July, 1896, *Sheldon 3622* (U. S. Nat. Herb.); Pagosa Springs, 3 June, 1883, *B. H. Smith* (Phil. Acad. Nat. Sci. Herb.); southwestern Colorado, Hayden's U. S. Geol. Survey, 1875, *Brandegee* (Mo. Bot. Gard. Herb.); wet mountain valley, July, 1885, *Kettler* (Gray Herb.); in dry fields, Mancos, alt. 2135 m., 8 July, 1898, *Baker, Earle & Tracy 446* (Mo. Bot. Gard. Herb.); Rocky Mountains, coll. of 1888, *Tracy* (U. S. Nat. Herb. 48706).

Nevada: eastern Nevada, coll. of 1883, *Meeham* (Phil. Acad. Nat. Sci. Herb.).

New Mexico: dry hills, vicinity of Raton, Colfax Co., alt. 2100–2380 m., 21–22 June, 1911, *Standley 6278* (U. S. Nat. Herb.); upland slopes, Catskill, June–July, 1895, *Mrs. O. St. John 139* (Gray Herb.); plains on and near the Sierra Grande, Union Co., alt. 2100–2935 m., 19 June, 1911, *Standley 6123* (U. S. Nat. Herb.); along the river and in damp meadow, vicinity of Chama, Rio Arriba Co., alt. 2380–2850 m., 8 and 9 July, 1911, *Standley 6532, 6734* (U. S. Nat. Herb.); pass southeast of Tierra Amarilla, Rio Arriba Co., alt. 2300 m., 18 April–25 May, 1911, *Eggleston 6531, 6595* (U. S. Nat. Herb.); Hillsboro Peak, Grant Co., alt. 3100 m., 27 May, 1904, *Metcalfe 938* (U. S. Nat. Herb., Gray Herb., and Mo. Bot. Gard. Herb.), TYPE of *S. Metcalfei*; Willow

Creek, 8 Aug., 1908, *Wooton* (U. S. Nat. Herb.), TYPE of *S. remifolius*.

78. S. Wardii Greene, Pittonia **4**:116. 1900; Heller, Cat. N. Am. Pl. 231. 1900. Pl. 3, fig. 3.

A low herbaceous perennial, glabrous or slightly tomentulose in the leaf-axils; stems tufted, erect, less than 1 dm. high; lower leaves oblong-oblanceolate including the petiole 1.5 to 4 cm. long, 3 to 10 mm. broad, entire or dentate towards the obtuse or rounded apex; stem-leaves few, more or less bracteiform; inflorescence a terminal round-topped rather dense cyme; heads 6 to 8 mm. high, radiate; involucre campanulate, sparingly calyculate, glabrous or nearly so; bracts of the involucre about 13, linear-lanceolate, 4 to 5 mm. high; ray-flowers 8 to 10, rays yellow; disk-flowers numerous; achenes glabrous.

Distribution: high mountains of Utah.

Specimens examined:

Utah: Fish Lake Mountain, and Thousand Lake Mountain, alt. about 3500 m., U. S. Geol. and Geog. Survey of the Territories, 8 July, 1875, *Ward 332* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.), TYPE. This species may be looked for in herbaria under *S. aureus* var. *alpinus* under which name it was distributed.

79. S. anacletus Greene, Pittonia **4**:307. 1901; Rydb. Fl. Colo. 395. 1906; Coulter & Nelson, Manual Cent. Rocky Mountains 579. 1909. Pl. 4.

S. microdontus (Gray) Heller, Bull. Torr. Bot. Club **24**:479. 1897, not Baker; Cat. N. Am. Pl. 146. 1898, and ed. 2, 230. 1900; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902; Wooton & Standley, Contr. U. S. Nat. Herb. **19**:746. 1915.

S. Toluccanus var. *microdontus* Gray, Syn. Fl. N. Am. **1**^{2}:388. 1884, and ed. 2, 1886.

S. Wootonii Greene, Bull. Torr. Bot. Club **25**:122, *pl. 331, figs. 1, 2.* 1898.

An herbaceous perennial, glabrous throughout and usually glaucous; stems one to several from an ascending fibrous-

rooted rather stout rootstock, simple or branched, erect, 2 to 5 dm. high; lower leaves obovate to oblong-oblanceolate, including the petiole .5 to 2.5 dm. long, .5 to 4.5 cm. broad, thick and firm in texture, rounded to submucronate-acute at the apex, entire to sinuate-denticulate, gradually narrowed at the base into a slightly winged petiole; stem-leaves few, oblanceolate to lance-attenuate, sessile and entire; inflorescence terminating the stem and branches in a simple or compound corymbose cyme; heads 10 to 12 mm. high, radiate; involucre campanulate, calyculate; bracts of the involucre about 13, linear-lanceolate, 7 to 9 mm. long, acute, glabrous except at the brownish penicillate tips; ray-flowers 8 to 10, rays yellow; disk-flowers numerous; achenes striate, glabrous.

Distribution: Colorado to northern Mexico.

Specimens examined:

Colorado: pine woods below Berthoud's Pass, alt. 3200 m., 10 Aug., 1874, *G. Engelmann* (Mo. Bot. Gard. Herb.); summit of steep mountains, Estes Park, alt. 3050 m., 7 July, 1912, *Churchill* (J. R. Churchill Herb.); Tolland, alt. 2740 m., 23 July, 1913, *Overholts* (Mo. Bot. Gard. Herb.); damp places in the valley near Empire, alt. about 3050 m., 21 July, 1892, *Patterson 199* (Gray Herb.); valley near Empire, alt. 2590 m., July, 1892, *Patterson 202* (Mo. Bot. Gard. Herb.); Breckenridge, coll. of 1887, *Bereman* (Mo. Bot. Gard. Herb.); Redcliff, Eagle Co., 17 July, 1902, *Osterhout 2704* (Phil. Acad. Nat. Sci. Herb.); Leadville, 6 July, 1886, *Trelease* (Mo. Bot. Gard. Herb.); "Sawatch" Range, alt. 3350 m., Aug., 1880, *Brandegee* (Gray Herb. and Mo. Bot. Gard. Herb.); head waters of Clear Creek, etc., coll. of 1861–62, *Parry 21* (Gray Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Lat. 39–41°, *Hall & Harbour 326* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Taylor River, alt. 2895 m., Hayden's U. S. Geol. Survey, 3 Aug., 1873, *Porter* (U. S. Nat. Herb.); meadows, South Cottonwood Gulch, Chaffee Co., alt. 3200 m., 9 July, 1892, *Sheldon 169, 488* (U. S. Nat. Herb.); Silverton,

July, 1889, *Eastwood* (U. S. Nat. Herb.); Silverton, alt. about 2895 m., 3 and 16 July, 1898, *ex Herb. Colorado State Agr. Coll. 3097, 3117* (U. S. Nat. Herb.); Pagosa Springs, 4, June, 1894, *B. H. Smith* (Phil. Acad. Nat. Sci. Herb.); Little Kate Mine, La Plata Mountains, alt. 3352 m., 16 July, 1898, *Baker, Earle & Tracy 552* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); La Plata River, 16 July, 1898, *Baker, Earle & Tracy 994* (Mo. Bot. Gard. Herb.); Rocky Mountains, coll. of 1868, *Vasey* (U. S. Nat. Herb.).

New Mexico: pass south of Tierra Amarilla, Rio Arriba Co., alt. 2320 m., 18 April–25 May, 1911, *Eggleston 6530, 6617* (U. S. Nat. Herb.); pine woods, vicinity of Brazos Cañon, Rio Arriba Co., 21 Aug., 1914, *Standley & Bollman 10676* (U. S. Nat. Herb.); Rio de la Casa, above Mora, 30 May–1 June, 1902, *Sturgis* (Gray Herb.); valley of Santa Fé Creek, at the foot of mountains, ten miles above Santa Fé, coll. of 1847, *Fendler 477 (437)* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.); Sante Fé Cañon, nine miles east of Santa Fé, alt. 2440 m., 2 June, 1897, *A. A. & E. G. Heller 3648* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.); Hermit's Peak, San Miguel Co., Aug., 1884, *F. H. Snow* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Rio Pecos, three miles above Winsor's, alt. about 2650 m., 30 June, 1908, *Standley 4083* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); White Mountains, Lincoln Co., alt. 2130 m., 15 Aug., 1897, *Wooton* (U. S. Nat. Herb., Greene Herb., fragment in Mo. Bot. Gard. Herb.), TYPE of *S. Wootonii;* White Mountains, Lincoln Co., alt. 2255 m., 25 Aug., 1907, *Wooton & Standley 3510* (U. S. Nat. Herb.); Cloudcroft, Otero Co., alt. 2590 m., 29 May–5 June, 1902, *Viereck* (Phil. Acad. Nat. Sci. Herb.); James Cañon, Sacramento Mountains, Otero Co., 26 June, 1899, *Wooton* (U. S. Nat. Herb.); Pinos Altos Mountains, 21 May, 1880, *E. L. Greene* (Gray Herb.); Pinos Altos, 15 Aug., 1895, *Mulford 881* (Mo. Bot. Gard. Herb.).

Arizona: San Francisco Mountains, coll. of 1884, *Lemmon 3264* (Gray Herb.); San Francisco Mountains, alt. 2135–

2440 m., 22 June, 1891, *McDougal 253* (U. S. Nat. Herb.); Kendrick Peak, near Flagstaff, May–Oct., 1900, *Purpus 8001* (Mo. Bot. Gard. Herb.); near Flagstaff, alt. 1850 m., 16 Aug., 1901, *Leiberg 5859* (U. S. Nat. Herb.); Apache-Verde, east of Baker Butte, Black Mesa Forest Reserve, 1 June, 1900, *Coville 1040* (U. S. Nat. Herb.); Santa Catalina Mountains, alt. 2740 m., April, 1881, *Lemmon 190* (Gray Herb.); Rincon Mountains, alt. 2285 m., coll. of 1891, *Neally 221* (U. S. Nat. Herb.); Santa Rita Mountains, alt. 2135–2440 m., 3 May, 1881, *Pringle* (Gray Herb., U. S. Nat. Herb., and Phil. Acad. Nat. Sci. Herb.); in pine forests, Santa Rita Mountains, alt. 2285 m., 8 June, 1884, *Pringle* (Phil. Acad. Nat. Sci. Herb.); Tanner's Cañon, near Fort Huachuca, coll. of 1882, *Lemmon 2786* (Gray Herb.); Willow Spring, 10–20 June, 1890, *Dr. E. Palmer 479* (Gray Herb. and U. S. Nat. Herb.); Ramsey Cañon, Huachuca Mountains, 10 April, 1915, *Blumer 5929* (Mo. Bot. Gard. Herb.); rolling andesitic pine land, Barfoot Park, Chiricahua Mountains, alt. 2440–2500 m., 17 Sept., 1906, *Blumer 151, 1388* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.).

Chihuahua: Colonia Garcia in the Sierra Madres, alt. 2285 m., 6 June, 1899, *Townsend & Barber 14* (Gray Herb. and Mo. Bot. Gard. Herb.).

80. S. toluccanus DC. Prodr. **6**:428. 1837; Schz. Bip. in Seemann, Bot. Voy. Herald 311. 1852–57; Hemsl. Biol. Cent.-Am. Bot. **2**:248. 1881; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902. Pl. 5.

An herbaceous perennial; stems 2 to 10 dm. high, erect or ascending from a thick stout rootstock; lower leaves ovate to oblong-oblanceolate, including the petiole 5 to 30 cm. long, 1 to 10 cm. broad, acute or obtuse, slightly crenate to conspicuously dentate with spreading subcartilaginous teeth, narrowed at the base into a winged petiole, thick and firm in texture, glabrous on both surfaces or slightly tomentulose in the early stages and soon glabrate; stem-leaves few, sessile and semi-amplexicaul, lanceolate, dentate to entire; inflorescence terminating the stem in a

few to many-headed glabrous or somewhat pubescent corymbose cyme; heads 10 to 15 mm. high, radiate; involucre campanulate, calyculate; bracts of the involucre 13 to 21, linear-lanceolate, 7 to 9 mm. long, glabrous or nearly so; ray-flowers 10 to 12, rays yellow; disk-flowers numerous; achenes striate, glabrous.

Distribution: Mexico.

Specimens examined:

Coahuila: south of Saltillo, Feb.–Oct., 1880, *Dr. E. Palmer* (Gray Herb.).

San Luis Potosi: Valley of San Luis Potosi, Aug., 1876, *Schaffner 277* (Gray Herb. and U. S. Nat. Herb.); Valley of San Luis Potosi, alt. 1830–2440 m., *Parry & Palmer 537* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.).

Jalisco: Nevada de Colima, alt. 3050–3650 m., 16 May, 1893, *Pringle 4374* (Gray Herb., U. S. Nat. Herb., and Mo. Bot. Gard. Herb.).

Michoacan: north slope of Mt. Patambau, alt. 2895–3350 m., 1–4 Feb., 1903, *E. W. Nelson 6598* (U. S. Nat. Herb.).

Mexico: Sierra de las Cruces, 11 Sept., 1892, *Pringle 5261* (Gray Herb.); Nevada de Toluca, 15 Oct., 1903, *Rose & Painter 7901* (Gray Herb.).

Federal District: Serrania de Ajusco, alt. 3050 m., 16 April, 1898, *Pringle 6812* (Gray Herb., U. S. Nat. Herb., Phil. Acad. Nat. Sci. Herb., and Mo. Bot. Gard. Herb.).

Southern Mexico: "cuesta de las papao pr. Angangueo", Feb., 1830, *Schiede* (Berlin Herb., Gray Herb., and U. S. Nat. Herb.); wet places on Mt. Ixtaccihuatl, alt. 2740–3050 m., Nov., 1905, *Purpus 1509* (U. S. Nat. Herb. and Mo. Bot. Gard. Herb.); Mt. Orizaba, 21 April, 1893, *E. W. Nelson 5* (U. S. Nat. Herb.); Mt. Orizaba, alt. 4025–4265 m., 18 March, 1894, *E. W. Nelson 281* (U. S. Nat. Herb.); wet grassy soil near timberline, Mt. Orizaba, March, 1908, *Purpus 2976* (U. S. Nat. Herb.); "Vera Cruz," *Galeotti 2183* (Kew Herb.); at the base of Jacal (Joerl), June, 1839, *Ehrenberg 1294* (Berlin Herb. and Gray Herb.); in woods near Guapi-

malpam, coll. of 1854, *Schaffner* (Gray Herb.); without definite locality, coll. of 1848–1849, *Gregg 690* in part (Mo. Bot. Gard. Herb.).

Var. **modestus** Schz. Bip. in Seemann, Bot. Voy. Herald 311. 1852–57; Hemsl. Biol. Cent.-Am. Bot. **2**:248. 1881; Greenm. Monogr. Senecio, I. Teil, 24. 1901, and in Engl. Bot. Jahrb. **32**:20. 1902.

Stems slender, 3 to 4 dm. high, nearly naked above; lower leaves oblanceolate, 3 to 14 cm. long, .5 to 1.5 cm. broad.

Distribution: northwestern Mexico.

Specimens examined:

Northwest Mexico: Sierra Madre, *Seemann* (Kew Herb. and Gray Herb.).

Chihuahua: Mound Valley, south of Pacheco, 12 June, 1891, *Hartman 690* (Gray Herb. and Mo. Bot. Gard. Herb.).

(To be continued.)

Explanation of Plate

PLATE 3

Fig. 1. *Senecio Rosei* Greenm.
Mexico

From the type specimen, Rose No. 2157, in the Gray Herbarium of Harvard University.

Fig. 2. *Senecio Wardii* Greene
Utah

From a co-type specimen, Ward No. 332, in the Gray Herbarium of Harvard University.

Fig. 3. *Senecio hesperius* Greene
Oregon

From Howell's No. 160 in the Gray Herbarium of Harvard University.



GREENMAN—MONOGRAPH OF SENECIO

COCKAYNE, BOSTON.

EXPLANATION OF PLATE

PLATE 4

Senecio anacletus Greene
United States

From Heller's No. 3648 in the Herbarium of the Missouri Botanical Garden.



GREENMAN—MONOGRAPH OF SENECIO

COCKAYNE, BOSTON.

EXPLANATION OF PLATE

PLATE 5

Senecio toluccanus DC.

Mexico

From Pringle's No. 6812 in the Gray Herbarium of Harvard University.



GREENMAN—MONOGRAPH OF SENECIO

COCKAYNE, BOSTON.